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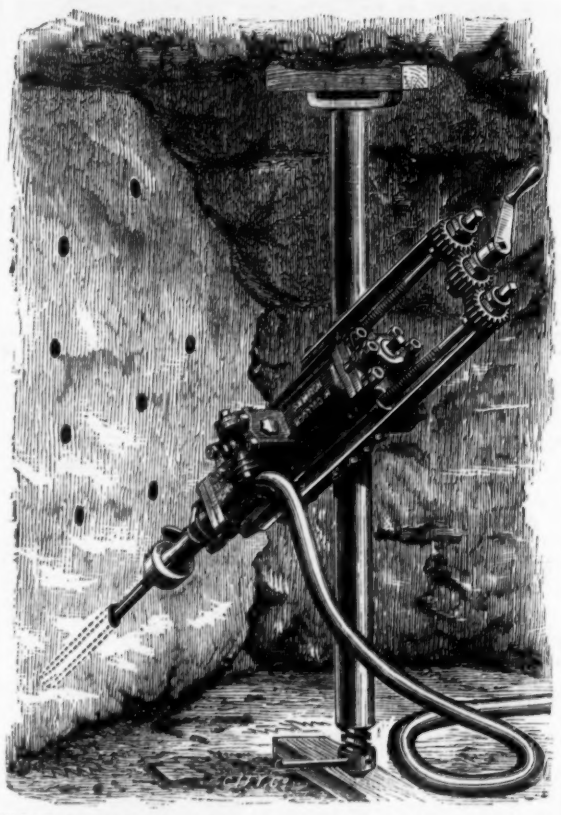

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Mining Institute of Cornwall, 1877.
Paris Exhibition, 1878.

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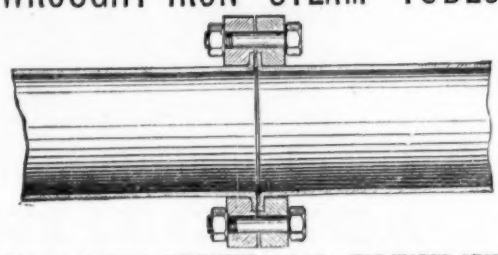

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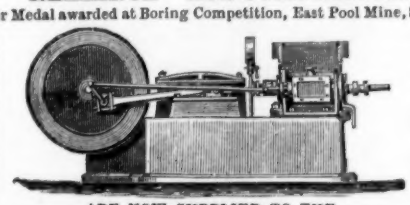

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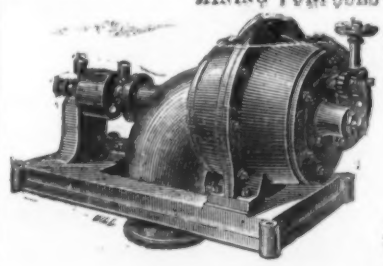

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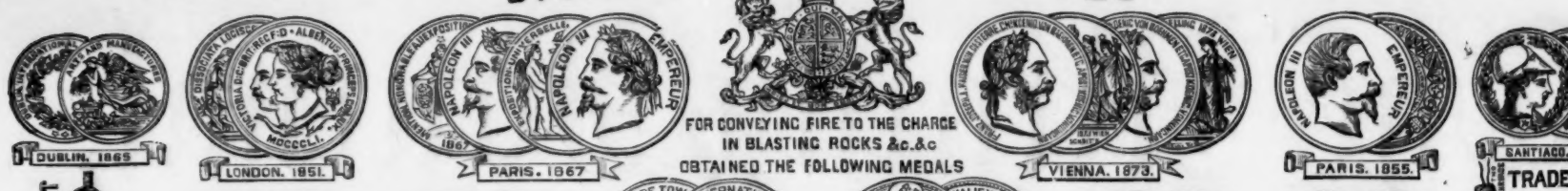

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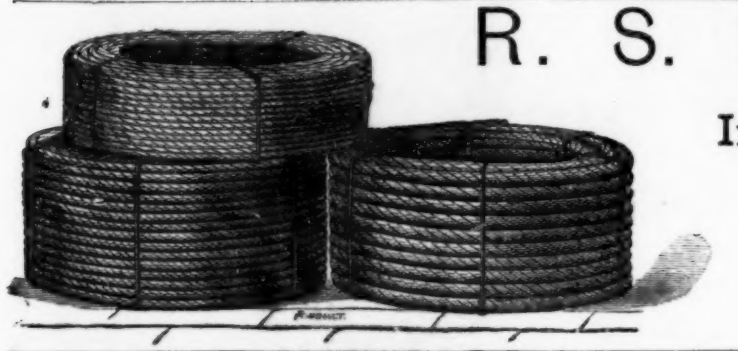

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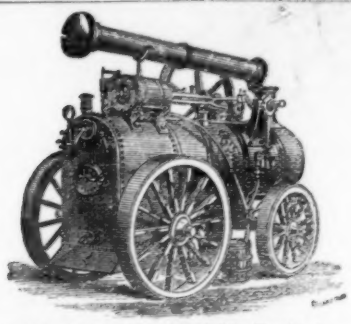

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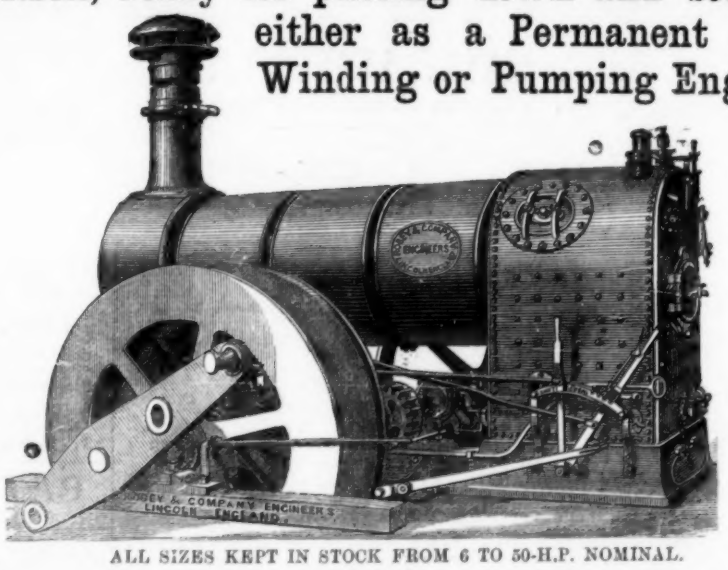

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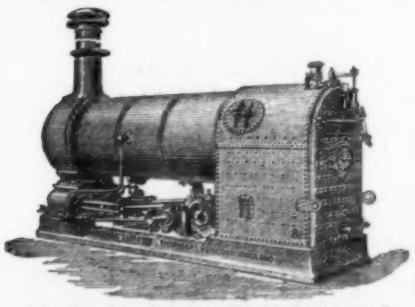

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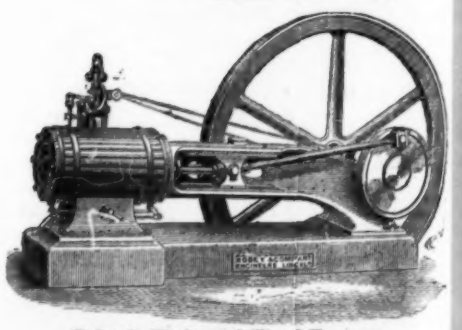

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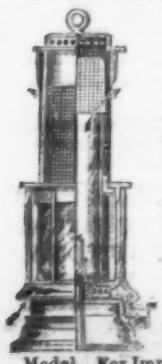

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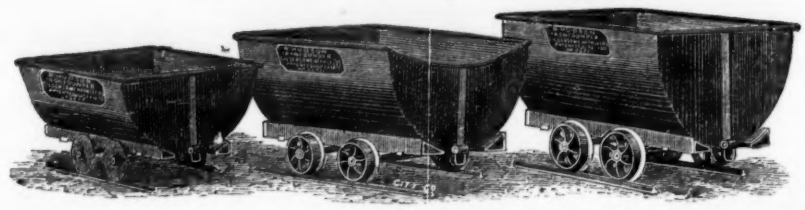
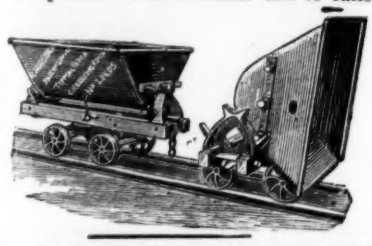
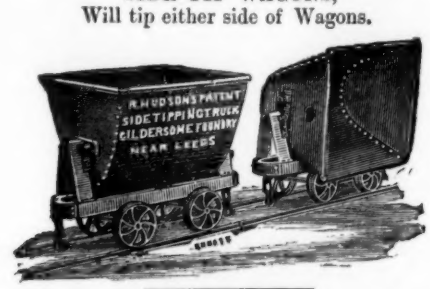


12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.

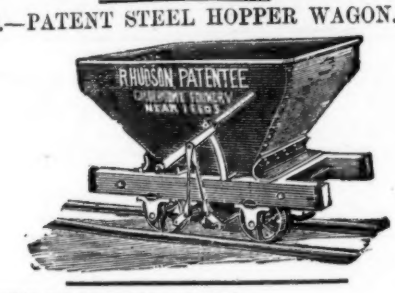
2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.



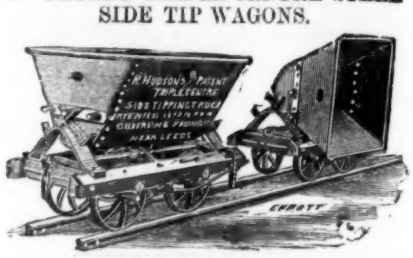
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,
Will tip either side of Wagons.



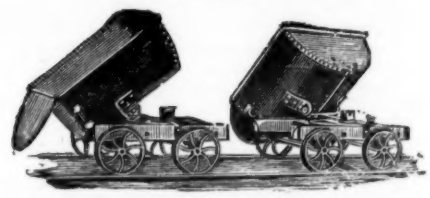
13.—PATENT STEEL HOPPER WAGON.



3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



9.—PATENT STEEL ALL-ROUND TIP WAGON.

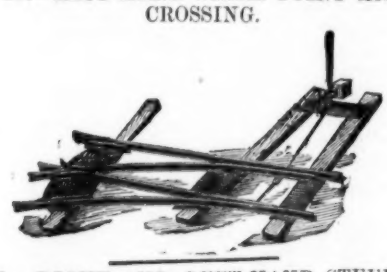


14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF ACTING if desired.)

15.—STEEL CAGE.

4. PATENT STEEL PLATFORM OR SUGAR CANE WAGON.

10.—LEFT-HAND STEEL POINT AND CROSSING.



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As supplied to H.M. War Office for the late war in Egypt).
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(Made from 10 gals. capacity UPWARDS to any desired size.)

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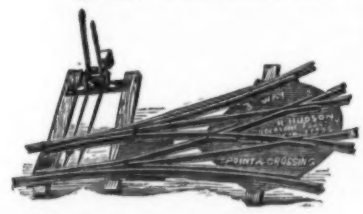

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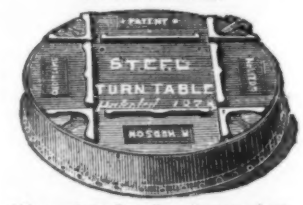

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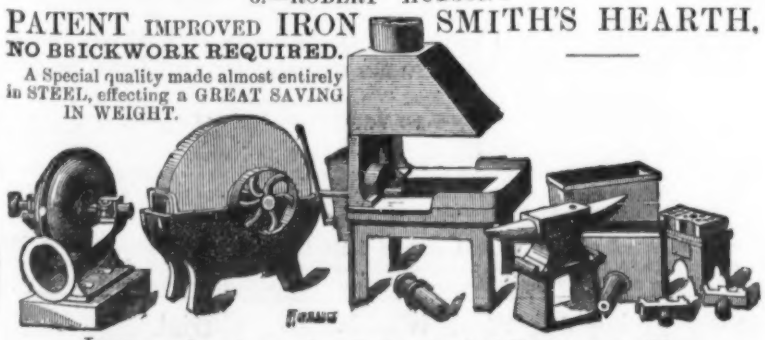

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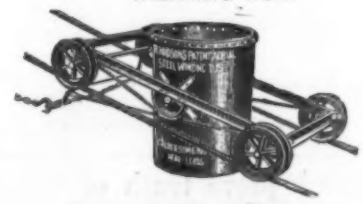

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ONE man can EASILY tip ANY WEIGHT in these wagons.

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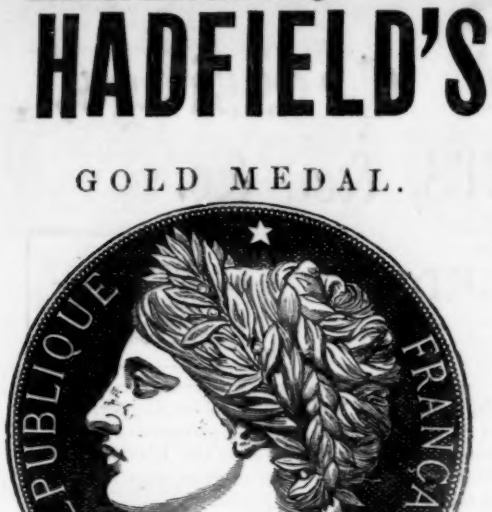

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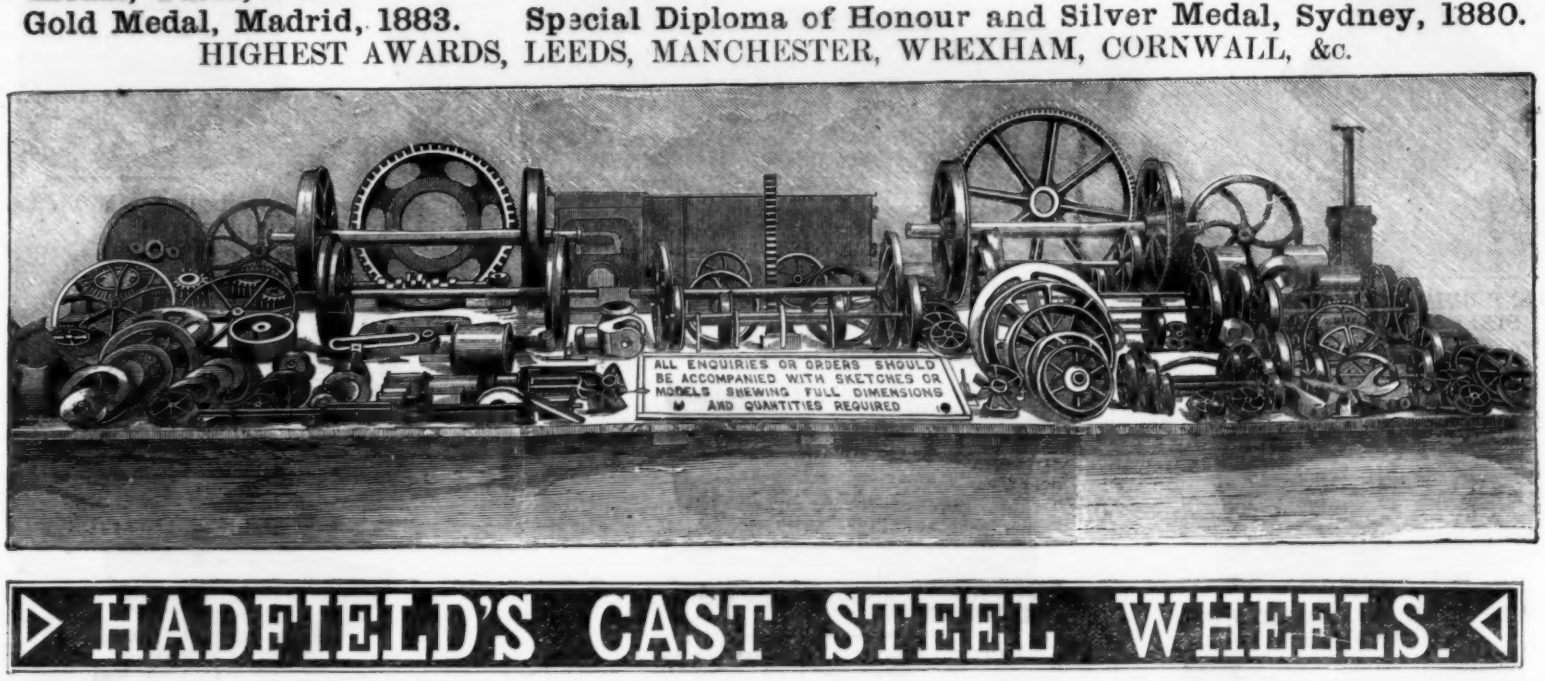
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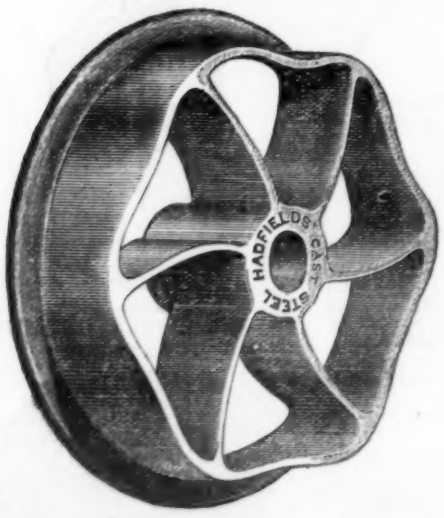
X

TOUGHNESS



Special attention is drawn to the slight indendations produced by the numerous and heavy blows, thus bearing out our claims for producing a special tough and tenacious steel which will not break or bend easily out of shape, and thus withstand the rough usage experienced at collieries, &c.

X This view represents one of Hadfield's Steel Wheels taken out of stock, bedded upon an anvil (thus getting full force of blow), then hammered COLD with no less than 45 swinging blows of a 14 lb. steel sledge hammer. We undertake that this same wheel, which may be seen at our works, can be heated in a smith's fire, straightened and put to use again; or if desired, a piece therefrom drawn out into a chisel, knife, &c.

This only represents an ordinary specimen of our manufacture.

DURABILITY

Section taken from a wheel kindly furnished by a customer who has many thousands at work. This wheel has run **40,000** miles, carried nearly **10,000** tons of coal, and although at work almost night and day for over five years is only worn so slightly, as shown above—**one-eighth of an inch!!** The wheels in question were 9 inches diameter, and weighed only **14 lbs.** each when put to work. This is only one out of many similar examples of the extraordinary durability of our material.

Prices **per set** furnished on receipt of sizes, either for wheels only or fitted together with Steel Axles by our well-known patent **fast** method. *When so fitted by us we undertake that our wheels shall remain* **fast** *as long as the wheels and axles last.* Upwards of *half-a-million* are now in daily use fitted by Hadfield's patent fast method. This is the only system that successfully withstands the great strains experienced in collieries, &c., without working loose.

NOTE.—Beware of spurious and cheap imitations which eventually work loose, causing great loss and annoyance, as well as bringing discredit on the name of Steel Wheels and Axles. We are constantly replacing such. See, therefore, that Hadfield's name is on every wheel.

We also solicit attention to the following articles, which, in addition to our well-known Patent Steel Wheels and Axles, we are now largely supplying in our CAST STEEL, on account of their great strength combined with durability and lightness.

Rollers, Pulleys, Frames, and Stands.—See our lists of over 240 different patterns. They possess great durability, lightness, and strength, and add considerably to the life of the steel or other ropes.

Self-oiling Wheels (Patent).—Many thousands now at work. Save at least 50 per cent. of oil or grease. Easily charged or refilled. Reduce friction and wear and tear to a minimum.

Pedestals, Bushes, Cage Guides, Buffer Boxes, Points, Crossings, and other Colliery Castings of every description.

Over 1700 different patterns of above in stock, ready for use on the shortest notice. New patterns made to suit special requirements free of charge for quantities.

Steel Axles to suit all classes of haulage. We manufacture a special mild quality of steel suitable for this purpose, and have many *hundreds of thousands* in daily use giving every satisfaction.

Steel Gearing of all kinds. Machine moulded or from full patterns.

Miscellaneous Steel Castings, up to 16,000 lbs. each, to replace expensive wrought-iron and steel forgings and heavy iron castings. Tensile strain of our castings 35 to 65 tons per square inch (as tested by Government) varying according to purpose required, with 20 per cent. elongation.

Note.—Beware of spurious and cheap imitations which eventually work loose, causing great loss and annoyance, as well as bringing discredit on the name of Steel Wheels and Axles. We are constantly replacing such. See, therefore, that Hadfield's name is on every wheel.

N.B.—Note the Address, and prove truth of the above by giving our Steel Wheels, &c., a trial.

HADFIELD'S STEEL FOUNDRY COMPANY, HECLA WORKS, ATTERCLIFFE, SHEFFIELD.

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Original Correspondence.

KIMBERLEY DIAMOND MINING.

SIR,—There can be very little doubt that diamond mining here has seen its best days notwithstanding that the deeper some of the mines are worked the more diamonds they produce per ton of stuff. This is particularly the case with the Kimberley and De Beers Mines, the latter of which seems to be the only mine here which is worked with the object of dividends. It is difficult to understand with what object the Kimberley Mine is being worked; for if the diamonds are raised at a loss at the present depth the loss will be proportionately greater as greater depth is attained. No person doubts that at a depth of about 600 ft. they will encounter a sea of water, yet no provision is being made for such an event. The only hope I see of getting any good out of this rich property is by placing the whole concern in the hands of some powerful English company. But as most of the South African diamond mining companies which have been most successfully floated in England have been downright swindles, I presume the British public have had their fill of trickery and floating reef. The meeting of the Kimberley Central Company ought to open the eyes of European shareholders as to how the money goes. Paying large sums to newspapers for flash articles is no doubt in the interest of those share-jobbers who are behind the scenes, but the *bona fide* shareholders suffer. Mr. Fenton did good service in calling attention to the irregularities of the company, and if there were more of his stamp here we outside shareholders should soon get our share of the profits.

The scoundrels who murdered the five men during the late strike have not yet been brought to justice; and there is very little chance of their being hung, since justice seems to be purchased per carat, whether illicit or otherwise. However, the men have gone quiet too suddenly to please me; and it is my opinion the next time they come out on strike they will be armed the same as the illicits, and then the murderers will have summary justice meted out to them. My sympathies are entirely with the workmen, who struck against the most abominable and degrading set of rules that could possibly disgrace humanity. The white men are placed on a level with the black savages, and are liable to be searched, stripped, and have their mouths, &c., forced open and overhauled in the most offensive manner by a set of searchers, many of whom have been convicted of almost every crime. One of the most disgusting sights here is:—When a black is supposed to have swallowed a diamond, he is tied up to a stake, stripped naked, kept without food, and physiced until he has passed a diamond, or is past praying for. It was against these revolting rules that the Europeans struck, and for which some of their numbers were cruelly murdered. Some of our legislators are doing their best in Parliament to put matters straight, but the opposition they meet from some of our pure-minded and disinterested editors render it a very difficult task.

The news from Jagersfontein is even worse than usual. I saw some managers of Jagersfontein companies here last week, and they spoke of their own companies as bubbles, swindles, &c., and said the mine would never pay honestly. As there are some of the Jagersfontein bubbles in the London market I will write fully on this property in the course of a fortnight.

> "Heaven for his mercy, what a tide of woes
> Comes rushing on this woeful land at once."

The small-pox has again broken out with a vengeance. Robberies are very common; and now that incendiarism is being put down there is scarcely a paying industry in the place. CORRESPONDENT.

Kimberley, June 7.

EXTRACTION OF GOLD FROM QUARTZ.

SIR,—"Gold Miner" in the *Mining Journal* of Feb. 23, in reply to "Gold Seeker" from St. Stephen's Club, says amongst other persons who might afford him information as to the extraction of gold from quartz, &c., that I would. I certainly shall be very glad to tell him what he requires to the best of my ability. He must, however, remember that the association of gold with minerals varies in nearly every reef or lode, and may require different treatment in detail. He asks who is the principal authority on the extraction of gold and silver from quartz and other ores, and is there any system par excellence for the purpose? Now, judging from the correspondence in your Journal, Mr. Editor, I should certainly say Mr. Moon is the principal authority on such matters. At any rate he claims to be able to do far more than anyone in this part of the world pretends to do—save all the gold by amalgamation only. Do our very best here we cannot save all the gold by even adopting several processes one after the other. The losses here per ton range from 2 dwts. up to over 1 oz. of gold, and for Mr. Moon's benefit let me tell him he has an unlimited field on our gold fields for his operations, as we have millions of tons of quartz tailings that are pretty well known to contain 5 dwts. and upwards of gold per ton, and a considerable proportion of that "free gold." Our mining companies here would be very glad to let their tailing heaps on tribute to him at from 5 to 25 per cent. on the gross yield of gold obtained.

Further, in reply to "Gold Seeker" I may tell him that no pulveriser has yet supplanted stamps in Australia; but our stamps are not the old-fashioned stamps by any means. They are very much improved stamps, but still stamps rotating, &c., but far from perfect or satisfactory, and we look for a better reducing machine or combination of machines than those we now have in use. We also look for better gold-saving appliances such as will catch the very fine gold that floats away, and that may by careful observation be seen shining in the sun light floating in water after it has passed through several settling pits. If Mr. Moon can supply us with an amalgamator that will save all the gold, or even all the free gold, then let him come here at once, make his fortune, and place our gold miners under an everlasting obligation.

During the past 20 years hundreds of amalgamators of various kinds have been patented in Victoria alone, and many scores have been fairly tried. The prevailing amalgamators at the present time are copper plates coated with mercury, and ripples filled with mercury. More fine gold no doubt could be saved than is done in many batteries by more careful attention; but the main question considered at present is what will it pay to save, and whether it will not pay best to put through a larger quantity with a certain loss of gold than a lesser quantity with less loss. The rule is to put through the big quantities, and put up with the losses, or let the tailings to Chinamen at from 400*l.* to 1000*l.* per year rent. The Chinese save some of the fine free gold in their big cradles by a process which I need not go into the details of, but which is very simple, and acts very well under the motive of the patient industrious Chinee. In order to put through large quantities of reef stuff the holes in the gratings are necessarily about 80 or 100 to the inch, the reduced stuff then passes over ripple board tables with copper plates followed by blanket tables, strakes, or other appliances for catching pyrites, &c., and thence to the tailings or waste heaps. No doubt in the future some kind of pulveriser will be adopted to further reduce the reef stuff, mainly quartz, followed by amalgamators, &c., in order to save some of the present losses in fine gold.

Although in some of our mines here 3 dwts. of gold or less per ton will yield a profit, in many others 6 dwts. and even 10 dwts. will not pay expences. A great deal depends on the circumstances of each mine—for example, hardness of the ground, size of the reef, cost of firewood and materials, amount of water in the mine, distance and situation of battery, supply of good or bad miners, &c. Many gold mines are handicapped very heavily in such matters, in some cases necessarily, and in many others through lack of judgment and due consideration by those who first laid out the works and the sites for machinery. There are, however, many points in the management of mines that are within the control of managers; and a careful man coming after an indifferent one can materially lessen the expenditure and increase efficiencies. No item of constant expenditure is too small to escape the scrutiny of a painstaking earnest manager. We have a considerable number of such men in our midst, and they are always eager to receive and duly consider reasonable suggestions for economising labour or expenditure; and, what is more, they are ready to adopt them if found good. To these men many dividends in our gold mines are due, and many calls obviated. Such matters in detail are known only to a few interested persons as a rule, and not to the general body of the shareholders. Going round as I do professionally from gold field to gold field and mine to mine in Australia, and periodically visiting many mines to report on them, I can but notice the wide differences in the modes of management in gold mines, and observe the good, bad, and indifferent, and it affords me much pleasure to testify to the good. WM. NICHOLAS, F.G.S.,

Melbourne, May 16. Consulting Mining Engineer.

ROYAL UNIVERSITY OF MINING AND SCIENCE.

SIR,—Entirely agreeing with the spirit of your article of June 21, I cannot but think that the co-operation of the South Kensington authorities would be of great practical value in the removal of existing anomalies. The particular professors whose activity has accomplished an amalgamation obviously convenient to themselves, but as clearly disastrous to the students herded in the amalgamation classes and laboratories, cannot fairly complain of the charges made against them. Men of their standing might fitly take part in the completion of a scheme that is as yet an incomprehensible anomaly. The amount of their present salaries has been long since detailed in the newspapers as a scandal, and the revelations of Dr. Percy in your pages have justified the belief that the pretexts for the removal of the School of Mines were utterly indefensible. Activity where their own crotchets and convenience are not concerned would peculiarly become the leading spirits in question. The addition of a mathematical class to the School of Mines course is a preposterous excuse; it is at the expense of other subjects, and a proper knowledge of mathematics should be required on entrance, as in all other mining schools as well as by medical and other faculties. The new class of mining surveying is a boon, but might have been equally well added at Jermyn-street, since that subject is hardly required for science teachers. Had natural history been definitely separated from the School of Mines there seems no reason why the school should not have remained combined with the Museum of Practical Geology and the mining library, in which the students could formerly profit between the lectures. A School of Mines with its classes at Kensington and its museum and library in Jermyn-street is a crying absurdity. If anything can justify the existence of such a school in London it is the advantage of a special library and museum as its most essential nucleus.

The School of Mines, in Jermyn-street, was established through the efforts of Prince Albert, who endeavoured to introduce in England the principles of education which have made Prussia the head of Germany and arbiter of the Continent. Whoever has seen at Berlin the shabbiest opera house and the finest school of mines in Europe will look with mingled feelings on the buildings supposed to honour the memory of a Prince whose efforts were supremely practical and deeply patriotic. His work in Jermyn-street was fitly inaugurated by him in words which Mr. Robert Hunt has done well to recall in a recent volume on British mining. He recognised the importance of aiding an interest which has dowered Germany with a sturdy and intelligent population in her most barren districts, a population of inestimable value in times when the prosperity and place of nations is little affected by any fashionable apotheosis of the fiddle. Yet even the Mining Record Office is now practically abolished, and with the same shame-faced tactics that have accomplished the abolition of the School of Mines. Those who have destroyed Prince Albert's work in the interest of educational crotchets, condemned in unmeasured terms by many excellent authorities in both art and science, or in the interest of a more questionable propaganda, might fitly aid in carrying out some one small portion of the tried system he strove to introduce. A Cornish School of Mines would be certainly the least disputable example of that system. The schools of Clausthal and Freiberg preceded that of Berlin, and their facilities for the combination of practical and theoretic science have born brilliant fruit in the superiority of German scientific work. I know no subject in science, and especially amongst its applications, on which I would not choose a German book. No elementary manual of mining can bear comparison with that just published by Köhler, of Clausthal, which in every line and woodcut is the work of a man daily occupied in combining theory with industrial practice. On many subjects there exists no manual in any other language. On Chemical Geology there is a German manual of 3000 condensed pages; and another of similar dimensions is appearing to supersede it, and in a still more condensed form. On any branch of mining the only manuals of any thoroughness and really practical correctness are written in the German tongue. Almost the entire progress of mining as a science may be attributed to German engineers. In England we have the scientific men and the practical men; the former write without practice, the latter have practice and do not write, and the result is the stagnation that Mr. Hunt describes, and the consequent ruin of British mining. Anglo-Saxon energy is expected to evolve at random the cultured plant of higher technical education that other civilised Governments have matured as a first essential for half-a-century and more. And so for intelligent and suggestive descriptions of our Cornish mines and mining we must turn to the writings of Moissenet, representative of a country where there is scarcely a metallic mine in work, but where the first essentials of technical education have been long supplied.

Yet in spite of the imperfections of Cornish practice, especially in ore dressing, I believe there can be little doubt that a Cornish School of Mines would turn out the first miners in the world. Cornish practice is wanting in matters of theory that can be learnt in a school, but it affords in every detail of manipulation examples of the highest skill, and its very imperfections have taxed the resources and sharpened the practical insight of the miner. Daily familiarity with Cornish practice combined with the best theoretic instruction would be all that is required. A Cornish school would certainly attract nearly all the students of the London School of Mines. The fees for the associateship at Kensington are 105*l.* to 115*l.*, exclusive of instruments and apparatus; and those fees will not be readily abandoned so long as the preservation of the mere name of the School of Mines suffices to retain them. The expense of living in Cornwall would be about half that of London. The moral atmosphere would be healthy, and ample occupation for leisure hours would be afforded to those having any real desire to learn their professions; while as to those addicted to idling the sooner they abandoned mining the better for themselves and their friends. Foreigners would be attracted in considerable number, and many civil engineers and colonists would be glad to pass a session in obtaining real knowledge that would be a valuable supplement to their other acquirements; consequently, the school would have every chance of becoming self-supporting. Private enterprise would risk little in attempting to establish it. No Byzantine architecture would be required. The co-operation of the mine agents of standing and intelligence would soon provide an excellent museum. The badness of the times is a reason for no longer deferring an attempt to improve British mining. Your Cornish Correspondent answers for the facilities that would be afforded in the mines. Little would be required from Government; but the initiative would have to be taken in Cornwall.

I would add that the drawing by Leech, in Punch, arbitrarily referred to Cornwall in a letter signed "B.," in your pages of June 14, "belongs to a set of drawings made when down in Staffordshire, his wife's county;" and "B.'s" other statements appears as recklessly incorrect as his quotation. I am certain that most of those who know Cornwall would agree with me that a more sober well-conducted people could not be found in England, or a people more courteous and obliging to strangers. "B" has confused his impressions of Cornwall with recollections of the bear-garden at South Kensington. The lectures I have witnessed at the latter place were mainly delivered by the class, and the most striking experiments were those that accompanied the daily destruction of the apparatus on the retirement of the professor. Several assistants were I believe engaged in special workshops repairing the damage; at least such occupations left them little leisure for instructing the crowd of students of every age and description herded in the laboratories. It is a marvel that the latter with ample store of explosives at command have not yet brought the question of reform within the range of practical politics.

The views I express would I believe be found shared by most mining and metallurgical graduates of the School of Mines, and probably by some of the professors. It is a pity that the eminent promotors of the recent changes should create by their actions and position impressions which are doubtless erroneous, but natural and fairly justified. The blame may not be properly theirs, but they must expect to bear it, especially as none can doubt their power to accomplish the removal of anomalies.—*July 5.* SCOTIA.

CANADIAN MINING RAILWAY AND GENERAL INTELLIGENCE.

SIR,—The New Route to the Rockies.—Those who live quietly at home can scarcely comprehend fully the almost incredible strides America has made in the last 20 years. When I speak of America, I mean the Anglo-Saxon part of it, for although Mexico and the South American States have done something, yet it is nothing in comparison with the United States and Canada. Twenty years ago the first continental railway had not been finished, or was just being finished. To-day we have not only the Union Pacific from Omaha to Salt Lake and San Francisco, but the Southern Pacific, *via* Atchison, Topeka, and Los Angeles, to San Francisco; the Northern Pacific, *via* Helena, to Portland and Puget Sound; and the Canadian Pacific finished to the Rockies. The Canadian Pacific will be the best of the four roads. It is shorter, it passes through a more variegated country, with distinct features of its own, and it will be one railroad belonging to one company from the Atlantic to the Pacific. At present there are two breaks in the line, from Sudbury to Port Arthur, along the northern shores of Lakes Huron and Superior, and from Calgany to Port Moody across the Rockies and British Columbia. These spaces are being rapidly filled up, and probably within two years we will be able to start from Montreal and go through to Port Moody in a palace car without change and with great pleasure.

Now, let us look at the three lines of railroads as investments. The Canadian Pacific, on account of its being the shortest, on account of its passing the Rockies at a lower altitude, and on account of the thorough workmanlike construction of the line, will be able to carry freight and passengers quicker and with less expense than the other three. Then it has its own line all the way, and has not to deliver at Omaha and St. Paul to other lines; then it passes through British territory, where under the flag of the Union Jack the passengers are not likely to be called upon "to throw up their hands" while a pistol is presented at their heads. How long would the "James Boys" have carried on their robberies in Canada? They knew too much to come over here and try.

So far for the line as to its carrying capacity; what is it going to carry? Already the North West is sufficiently settled to warrant the assertion that the probable surplus wheat of Manitoba and the North-West this year will be about 2,000,000 bushels, while flax-mills and other industries are rising, and other products of the earth will claim attention. As for the cattle trade it is just in its infancy. When the price of an animal in the North-West is about 2*l.*, and in England about 21*l.*, and the freight not above 5*l.* to Liverpool, there is a margin which opens to capitalists and young men a field that deserves their consideration. The profit is too great for such a field to go a-begging long, and the Canadian Pacific Railroad will carry all this immense cattle trade.

Add to this the fact that the Government of Canada will permit healthy cattle to come across from Montana and go in bond through Canada to Liverpool, and the Canadian Pacific Railroad will get a great trade from that source. Still, the real bulk of the trade will come from Japan, Australia, and the East. Taking all these points into consideration, the conclusion seems to be evident that the Canadian Pacific Railroad will have a good traffic from the day it is opened through, and that this traffic will increase yearly till in ten years another track will be required.

Fast Steamships.—The trip of the Oregon to New York and other vessels has opened up the minds of our enterprising men. Why should not a fast line of steamers be established to run from Port Moody to Yokohama? On the Pacific they could count on more favourable weather, would have the trade winds in their favour on the passage to Port Moody, and by Canadian Pacific Railroad passengers would have the shortest route by rail either to New York or Montreal. The establishment of steamship lines in connection with such a road seems to be the next step to give us both the Japanese and Australian trade.

The Present Route.—At present passengers for the West leave Montreal, or Quebec, and come to Toronto, from thence to Owen Sound, and then they take the new steamers to Point Arthur, and from thence to Winnipeg. The time between Toronto and Winnipeg is about 36 hours. The boats are called Alberta, Athabasca, and Algoma. About 270 ft. long, fitted up in splendid style, of the best material and construction, lighted by electricity, and equipped with all scientific improvements, it is no wonder that the ocean traveller bound for the West hails this delightful break in railroad travel with enthusiasm. The capacity for steerage and cabin passengers is over 1000, and the accommodations are superior to anything yet on the lakes. With such scenery and on such a vessel after travelling by rail from Montreal, few will not prefer this to any route in summer. This will always be a favourite route as the North-West opens, and even when the railroad is built along the northern side of Lake Superior it is safe to predict the majority will take this delightful steamer excursion.

Emigration.—Our system of emigration is very bad. It is not any worse than the United States or that of Australia, but the whole world seems to be far behind the times with regard to emigration. The fact of it is, there is no system at all. It is a sort of "go as you please." Every individual does what he pleases, and the best he knows how to do; but as their knowledge of the country and of what they will require is very little, they make mistakes resulting in great loss of money, time, and energy. I have written before on this subject, and am convinced the more I see of English people, and the more I know of this country, to inaugurate a good common sense system of emigration for Canada is necessary. Canada is as large as Europe, and all new countries are different from old countries, it therefore behoves the Canadian Government to take steps to inaugurate a system for this new country. As Sir Charles Tupper, our High Commissioner, is now a resident of London, there are some hopes that a man who has been so eminent in the origin and success of the Canadian Pacific Railway will forthwith take steps to inaugurate the new Canadian system of emigration.

As in Victor Hugo's "Toilers of the Sea" the fight in a new country is against Nature. The "masterly inactivity" of Nature must be subdued and turned into productive activity. How would England proceed to fight a foe? Would she send out her armies and navies and tell them to "go as they please," and each man to take care of himself, let him make the attack or retreat whenever his individual will thought was the best time, to clothe himself as he pleased, to eat what he could get hold of, and to starve if he could get hold of nothing? Perhaps she has come the nearest to that kind of warfare when she sent poor Gordon to Kartoum; but we search in vain through the annals of English history for a parallel example of heartless cruelty toward brave men. As a general rule, a nation going to war with an enemy would have the best organisation, the best equipment, the best arms, the best men, the best ammunition it could procure; properly officered and properly disciplined under an organised system to contend with and conquer opposing forces. Such is the war against men; but when we come to consider the war against Nature, what would be considered ridiculous, absurd, and cruel in the former is thought to be all right in the latter. The fact of it is, people are just beginning to realise that if a regular organised system is a necessity for an army of war in its fight against men, a regular system is equally a necessity in the fight against Nature; and that, therefore, no time should be lost by Canada in organising the army of peace.

We have a vast country to subdue and bring under cultivation. The country is rich and fertile, and will more than pay for itself. Is it not foolish to go on any longer with this "go as you please" emigration policy? What is the use of the present wasteful expenditure of time, money, and energy? What heartless cruelty to spread over the "Great Lone Land" the individual soldier fighting alone against the tough sod of the prairie, the keen blizzard, and the cold of 20° below zero; away from all "household words," apart from the sound of the church-going bell, fighting solitary. As popula-

tion becomes denser in old countries, new countries must be filled; but what I contend for is organisation, so that every stroke in the subjugation of Nature will tell, and neither time, energy, or money will be wasted.

Sketch of Proposed Army of Peace.—1. A law similar to that of the army, giving power of discipline. 2. A contract for five years with each soldier. 3. Divisions into regiments, companies, and cohorts. Each regiment 1000 men, a company 100, a cohort 10. Each regiment to be properly officered by men who have had practical and theoretical education in agriculture, and particularly the requisites of the North-West. Each man to receive food and clothing and so much a day the first and second years, and in addition an interest in the crop afterwards. The Government to set apart ten townships or 230,000 acres for each regiment. The regiment to be furnished with the best agricultural instruments, houses, food, and all things necessary; a regular account of expenses to be kept. Any soldier to be allowed to sell out and be discharged if his substitute is considered suitable. Each soldier at the end of five years to be entitled to 160 acres, provided he is not in arrears, if so the land to be subject to the lien. At the end of five years each regiment to be dissolved and land divided. The result of this organised system would be that the country would be settled in a regular way, and the country would receive a great benefit, while the expense, at first great, would be all paid back, as the land will more than pay for itself. The first year would be the hardest fight, but they would be organised, equipped, and have money to back them. What a difference from the poor settler that wastes time, money, and lives a lonely life. Each regiment would be a nucleus in itself, and with proper officers who would be able to make bye-laws for each regiment there would be a home from the end of the first year, when houses would be up and matters in working order. It is time that this "go as you please" emigration policy should be stopped, and that the army of peace should be organised, and 20 regiments dispatched to the fertile land.

The Agricultural College.—The Government of Ontario in building and establishing the Agricultural College at Gwelph has done a good work. A man can receive a good education and in subjects that will be of practical advantage when he comes to want them. Unless you are going to be a lawyer or a clergyman or a doctor a degree of either the University of Toronto or Trinity College is of little benefit. It may be a pleasure to know all about the Peloponesian War and to be able to translate Homer and Thurcidides, and perhaps make a Greek verb, but no person will give you a nickel for it. Almost all the time spent in the university is practically thrown away. Whereas, if a youth of 18 is sent to the Agricultural College he gains in two years a knowledge of agriculture, geology, physical geography, botany, veterinary science, the English classics, and mathematics as far as will be of benefit, including mensuration; while he has become practically a good gardener, has a knowledge of live-stock, and a mechanic. When he comes out of the Agricultural College he is prepared to turn his hand to anything and make a living; when he comes out of Trinity College he has to depend on others to help him up to a profession, which when he does get he can seldom use, as there are as many doctors and lawyers in Canada as are required. The Ontario Government deserve great praise for the Agricultural College, although they make a great distinction. For the sons of Ontario tax-payers the fee is $20, or 4*l.*, a year, and for others $100, or 20*l.*, a year. In 1883 the College roll was 202, and in 1883 and 1884, from Oct. 1 to March 31, 109. Many of these men when they get their diploma go to the North-West. On the role of 1883 are the names of Viscount R. H. Boyle and Hon. H. G. Boyle, from Castle Martin, Ireland. They are settled somewhere about Fort McLeod or Calgany this year. For our country I consider the Agricultural College calculated to be of more practical advantage than all the colleges and universities put together. A man with such an education does not become a superfluous mat in the busy hive. He can turn his education to anything, and "paddle his own canoe." BOURONITE.

Gwelph, June 23.

SOUTH NORWAY COPPER COMPANY.

SIR,—Referring to the report in to-day's *Mining Journal* of the South Norway Copper Company (Limited) *v.* Feetham case, which was tried before Mr. Justice Hawkins early in the week, I would remark that the inducement to take shares relied upon by the defendant—that one small section of ore already exposed would yield a profit of 8000*l.*—was never held out to him. The statement made, and which was most clearly expressed in my memorandum accompanying the prospectus, was:—"Should the value of the ore-bearing ground already met with in adit continue to a depth of even 25 metres a profit of 8000*l.* for this short section alone might reasonably be reckoned on."—*Adelphi, July* 5. MAT. WOODIFIELD.

GOLD IN NORWAY.

SIR,—Since my last the local excitement has been increasing in this new gold field. Several new places have struck gold, and the old ones have improved on sinking. The Oscar Mining Company are pushing their work on rapidly, and getting their mill up to the mill site, but find they have a hard job to get their large boilers up the steep grade of their tramway; in the meantime they are finding gold in fresh parts of their property—and the Haugesund claim, adjoining them south, belonging to Mr. Jonnassen and party, has started another shaft nearer to the Oscar, and found a small quartz vein running down with very rich specimens among a rotten rusty gravel on the footwall, underlying a 3 ft. vein of quartz, which shows gold very thickly mixed through it, and as much as ½ oz. to the dish was washed out of this gravel, and several pieces of spongy gold, weighing over 1 oz. each, were picked out. They are not to be matched in any place I ever saw, except the Wentworth, near Bathurst, New South Wales, for the spongy rotten state of the gold. The diggers used to complain that it required 1 lb. of it to weigh 1 oz., meaning the bulk of 1 lb. of any other kind of gold; but still the Wentworth was one of the richest spots in Australia for its extent. About 1865 it was an old volcanic crater, surrounded with basaltic lava. We find tellurium and bismuth here always in company with the gold, but not mixed chemically with it. Visitors are on the increase, as there is a little better chance of accommodation around as the new houses are getting completed, and an hotel is in a fair way of commencing business this summer, but running a sort of restaurant in the mean time in the kind of stable or outhouse. The claims south of the Haugesund are putting down shafts, and some of them getting very good specimens. The Harald Haafager is sinking a shaft by contract, and gold can be seen plainly amongst the vein rusty quartz. I have not heard of any sales of importance lately. The one-eighth of Haugesund to Mr. Carl Gjors, of Stavanger, being the last from Neils, Uran; but I have not heard the amount paid. There is no doubt, however, that it went at a bed-rock price, and was a good bargain for the buyer, and a bad one for the farmer who sold it, but who still holds an eighth yet, for which he wants a much better price. There is no doubt that some good mines will be developed here, and as usual plenty of money spent around on places where there is not the slightest possibility of their finding anything but iron pyrites.

The firing at 12 and 6 o'clock is getting like the siege of Sebastopol. It is not very safe for visitors who get amongst the claims, and hear warnings of fire from all quarters, and do not know where to hide themselves. The weather has been very fine lately, and the country looks beautiful in places, though there is some of it very rocky and barren, as in all gold quartz districts; but one can always find delightful spots within a few miles distance.

I have not received any *Mining Journals* since June 1, and my letters all stopped, as I had written that I was going to London about the middle of June; but I find it difficult to leave, as the men here have no idea of sorting and keeping the different grades separate, and where the gold is in ounce pieces is not a good plan to put it out on the dump, where the visitors are as thick as flies round a jam-pot; and, as the Oscar has fenced their ground, we have all the patronage till we do so, but all the visitors are local men. We have not had any from England since Mr. Marchison, Capt. Daw, and Mr. York left, and I hear they are to return within a month. Here again there is some talk of forming a Norwegian company to work Jonnassen's mining claims. There are about 30 of them, and I believe some very valuable amongst them. Others taken up to shepherd the ground, and keep off intruders as much as possible. There is not a doubt that some of these places should be worked day and night, while the summer lasts. It is all daylight now; it never gets so dark as not to be able to read a newspaper any hour of the night, and in the winter it will be reversed, and very little daylight, so we must make hay while the sun shines. Please send my *Mining Journal* here, as I find there are other places on Bommel Island, to which they send letters and papers, and they remain for weeks till sent for. We have no post office or telegraph station near the New Rush yet, but expect one soon. JOSEPH BADDELEY.

Haugesund, Norway, July 5.

PREVENTION OF ACCIDENTS IN MINES.

SIR,—Considerable misapprehension evidently prevails as to the cause and prevention of accidents in mines even in quarters where one would expect such knowledge was the most easily obtainable, and the want of more Inspectors has been urged without sufficient ground. Thus, Mr. C. H. James, the Member for Merthyr Tydvil, the centre of a great mining district, who, in seconding the motion of Mr. Burt on Friday night last for the appointment of additional Inspectors, said that while the output of coal in South Wales was considerably less than in the North of England the deaths from mining casualties was just double, and this he attributed to the deficiency of inspection, as there was only one Inspector for the whole of South Wales. Now, practical men connected with mining know that inspection has little or nothing to do with the matter. As to "falls," which are of daily occurrence in South Wales, they are mostly due to the system of working, as has been forcibly pointed out by Sir George Elliot, himself a large mineowner in both Durham and South Wales, and whose statement on the subject is a most explicit reply to the remarks made by Mr. James. In his evidence before a Select Committee of the House of Commons, Sir George Elliot said—"Speaking as a mining engineer I think the seams of Durham and Northumberland are not safer so far as the roof is concerned than they are in Glamorganshire. I think they are very similar, and I should not attribute any difference in the results in fatal accidents to any difference arising from the natural physical condition of the two sets of mines, and yet comparing the two systems, taking the one where we prop and maintain the roofs, and where the whole thing is done by the owners, which is the North Country system, I find that for every 500,000 tons of coal worked out of Durham and Northumberland there are by the fallings of the roof and coal, which has to be propped up, 1·30 lives lost; whilst in South Wales for every 500,000 tons of coal wrought there are 3·20 lives lost—in round numbers there are nearly three times the number of men killed in South Wales, and that is palpably before the face of all concerned in the statistics." It is evident from the above statement that inspection has no relation whatever to the death rate from "falls," by which more persons are killed and injured than from all other causes put together. In Durham persons of skill and character are selected for a duty which requires both skill and judgment as well as experience, and they put in the timber, and may be said to be responsible for the safety of the men. In South Wales as well as in many other districts the miners themselves put in the timber, and who have no responsibility unless it be to look after their own safety, which many neglect. With respect to the propping being done, as in Durham, by experienced persons selected for the purpose, Sir George Elliot, said—"I am certain, and I said so in the House, that there would be a greater economy in human life by having that system urged and insisted upon than by any other measure connected with the Mines Regulation Act." It will be seen although there has been a great outcry for more Inspectors that there are other and, indeed, better means for preventing the loss of life and lessening the accidents in mines than that of appointing an additional number of Inspectors, especially if they are to be chosen from the working or practical miners. J. R.

Barnsley, July 8.

THE PRESENT PRICE OF METALS AND METALLIC MINES.

No. II.

SIR,—As you did me the favour to insert my last letter relative to the above, which treated of our home tin mines, I am induced to send a few remarks about our home copper mines, with the hope that they may have a beneficial influence on their future working. It seems to me a matter for regret that the copper mines of this country have been fast falling off for many years past, and it would seem to me a matter still more to deplore if all the copper mines at home are to succumb to foreign competition, particularly so as the price of that metal is very little lower than the price of tin, and very much higher in proportion than the price of lead.

We have mines now producing from 800 to 900 tons per month, also 600, 500, and 400 downwards, of copper ore, besides other minerals, such as arsenical mundic, tin, &c., which together are meeting the expense of production, and in some instances leaving a little on the right side of the ledger, and the question becomes, Can nothing be done to alter the working of these mines so as legitimately and fairly to place them in a state of profits and dividends; and, if so, What is the remedy to be applied? We have, therefore, to consider how it is that the foreign mines are enabled to supply copper at present prices. Surely not by working them by hand-power, but by rock-drills of the very best description, and which are in use in all the large and well-conducted mines abroad. If they worked by hand-labour alone we should have many advantages over them; but it is simply ridiculous and absurd to endeavour to contend against their machinery by manual labour at home, and unless our home copper mines are worked by the same class of machinery as foreign mines they must soon give up their present ghost of a chance to contend against them. It is, therefore, a case of "To be, or not to be;" and, if the former, the landlords of the mines of this description should be content, and ought to accept such royalties as would greatly assist this operation in being carried out. For instance, say 12½ per cent. of profits realised, with full compensation of value for ground destroyed, let the mines be rich or poor, and also fair rentals for water-courses and other necessaries required. If these mines are closed it will then be too late to act, and now is the time for one and all interested to do what is absolutely required, or to say good-bye to this industry for ever, as far as this country is concerned.

I will in my next treat of our home lead mines, as promised in my last.—*Goginan, Aberystwith, July* 8. ABSALOM FRANCIS.

MINING SPECULATORS.

SIR,—That there are "many blanks to a prize" is a proverb as applicable to mining as to any speculative investment. It is equally true that some have acquired colossal fortunes by judicious pursuits in the mining districts of Cornwall and elsewhere. Look at the Messrs. Williams of Scorrier. The late Mr. Michael Williams's personal estate was about half-a-million, besides large freehold estates in Devon and Cornwall. His brother, Mr. John Williams, of Burncoose, was just as rich, and their youngest brother, Sir Wm. Williams, Bart., was a millionaire. Mr. John Michael Williams, the son of Mr. Michael Williams, left a personalty of 1,600,000*l.*, and landed property exceeding a million sterling. His land agent—the late Mr. Richard Rosewarne—informed me that in seven years Mr. J. M. Williams laid out on land 700,000*l.*, but he had a large estate before then. There was probably no landowner in Cornwall or Devon so rich as he, and the whole of his wealth, and that of his relatives, came directly or indirectly from mining. Look, again, at the Messrs. S. and R. Davey, of Redruth, who gained very largely by the same pursuit. The late Capt. Joseph Lyle is said to have made about 100,000*l.* in a very short period by his discoveries in North Basset, &c. The late Capt. Thomas Teague, of Redruth, was still more successful in Tresavean Mine, Wheal Trumpet, &c. He held a very large interest in Tresavean, which yielded in all about 500,000*l.* profit. The late Mr. F. Pryor is said to have had at his command, at one time, nearly 100,000*l.* The shareholders in the Consolidated Mines divided 600,000*l.* profit. Devon Great Consols profit was about 1,300,000*l.* Dolcoath at the present time is enriching many a shareholder; East Pool the like. South Caradon, Wheal Vor, Great Work, Godolphin, Wheal Alfred, Alfred Consols, St. Ives Consols, Botallack, and a host of others may be called prizes, and each prize has many shareholders—a good mine being the property of many. Capt. Teague, of Treliske, near Truro, was very fortunate in Tincroft a few years ago, making a large profit in a brief period.

Truro, July 8. R. SYMONS.

BREAGE MINING DISTRICT.

SIR,—Persons have expressed to me their surprise that capitalists have not given more attention to this important mining district which has yielded such large returns, to wit—Wheal Vor, 272,000*l.* profit; Godolphin, 90,000*l.*; Great Work, 150,000*l.*; Trewavas, large profits, &c. There are many valuable tin-bearing lodes known in the district undeveloped, which justify the outlay of capital in their development. The recent discovery of a rich tin lode in Wheal Singer, close by Wheal Vor, in virgin ground, should encourage capitalists to investigate the lodes in the locality. Polladras Downs is an eligible site for resumptive operations. There are numerous places in that district which present fair symptoms of success if only mining energy were brought to bear upon them. At North Metal, east of Wheal Vor, the miners are sinking a shaft on a lode south of the lode, which is supposed to be Wheal Vor main lode; but it is not known which of the Vor lodes it is, because all the lodes are heaved by a cross-course. Its identity can be determined only by development. The shaft is now about 15 fms. deep, and miners are rising from the 30 fm. level on main lode to hole it. I hope that the perseverance of the promoters will be rewarded, and that ere long. R. SYMONS.

Truro, July 8.

WHEAL CAMBORNE.

SIR,—Now that Dolcoath—the celebrated old mine—has improved (although rich before) by the discovery of another rich tin lode, an impetus is given to the prosecution of the contiguous ground at the west—Wheal Camborne and Camborne Vean. It has been suggested that an amalgamation of these mines would be desirable. I do not see that much advantage would result to Wheal Camborne from such an arrangement, because it is now a large sett, and contains numerous lodes identical with those in Dolcoath. It embraces a large portion of Sir Vyell Vyvyan's part of Camborne town, of which the late workers could not obtain a grant, the reason assigned being that operations under the town would drain the wells from which the town was supplied with water. That reason no longer exists, there being an ample supply from the waterworks company's reservoirs, situate in Crowan. One very important advantage which the lessees of Wheal Camborne, and also Camborne Vean possess, is that the mines are drained by Dolcoath engines, about 180 fathoms deep, so that operations on a large scale can be conducted without any expense in pumping machinery. Mr. J. Elliott Square, who was on the mine a few days ago, gave orders for the erection of a winding-engine, skip-road, and other appliances for drawing up the ores exposed to view at different points in the mine. While I was standing by the ladder-shaft the miners brought up rocks of rich copper ore, which drew forth the admiration of the observers. Mr. Square made a handsome present to the men for their labour. One was a very heavy specimen for a man to carry over ladders. It is fair to conclude that the copper ore will give place to tin ore at deeper levels, as it has done in Dolcoath, and that, under proper management, with appropriate funds, this mine will become highly profitable, like its neighbour. The resident agent is Capt. Temby, and Mr. W. C. Vivian is the supervisor. The mineral rights belong in moieties to the representatives of Mr. Reynolds and Mr. F. G. Gregor.—*Truro, July* 9. R. SYMONS.

CLIFFORD AMALGAMATED.

SIR,—The announcement received from Capt. J. Prisk, of Wheal Lovell, on Saturday last, that these mines are to be re-worked, afforded me pleasure, because employment in the Gwennap district is scarce; and because I think that there are sufficient grounds for believing that the minerals in Cosgarne are far from a state of exhaustion. The refuse at the surface alone would pay well if treated for copper, tin, and other minerals, as the assays made by Mr. J. H. Collins and others sufficiently prove. I believe that the immediate operations are to be confined chiefly to a tin lode recently discovered in the adit, which is entirely unexplored from the adit to the surface, an extent of 40 fathoms. Of course, until machinery is supplied for drainage, nothing can be done below the adit level, and to place machinery to drain all these mines would be an expensive affair; but the drainage can be accomplished with half the number of engines which the late company had on the mines. If the tin lode just referred to turns out so well as it is hoped it will, the promoters will be encouraged, I dare say, to resume operations below the adit. The promoters are bold speculators, and deserving of that success which I wish may attend their adventures.

Truro, July 9. R. SYMONS.

ADVERTISEMENTS OF MINING SHARES AT FIXED PRICES.

SIR,—On perusing last week's Journal my attention was particularly attracted by, first, a letter from "R. N." upon the subject of advertising prices, and your reply thereto contained in your "Notices to Correspondents," and next by the commencement of a report you give of some legal proceedings, and headed "New Companies and Speculators." As it is, I think, evident that your remarks affect in one way or another all the mining brokers and sharedealers besides a large proportion of those who invest in mines, I venture to trespass upon your well-known courtesy, and to trouble you with the following on the subject. You state that the object of omitting fixed prices from brokers' advertisements is to "force up prices," that Mr. W. H. Bumpus "strongly opposes" this omission, and Mr. James H. Crofts expresses "indifference," while the market is "by no means unanimous." From a personal canvass of all gentlemen known as members of the Mining Market, besides the secretaries of over 70 of the best known and most influential mining companies, I think I am in a position to say that no thought of forcing up prices has entered into the head of any of those who deprecate the advertising of fixed quotations. Their sole object has been an endeavour to improve mining business, to prevent a generally admitted injury to all interested in mining, and to place dealing in mine shares in that position of fairness and respectability which it has never yet attained.

Upon the same ground—a personal canvass and the signatures of the parties referred to, I think I am right in stating that, with the exception of one gentleman who "strongly opposes" the movement which has taken place, there is the most perfect unanimity on the market, the second gentleman, who expresses "indifference," having signed the "request" (of February last, I think) to you on the subject, while he now evinces a willingness to concur in the movement if it be the general desire of the market. On the subject of unanimity it is further merely desirable to point out, in reply to your perfectly true statement, that some brokers only agreed to join upon the condition that all others should concur, that these are times when no one can afford to throw away business, and when absolute fairness is a necessity to all engaged in share dealing. The great increase of business which would be gained at the expense of his fellows by a single broker only advertising fixed prices will therefore be found ample reason for the condition referred to.

Having now done with the subject of unanimity I come to the reasons for the movement which has taken place. These are:—

First.—It is generally conceded by brokers and the public that the system of advertising prices has for many years been more or less entirely abused. The advertisements are solely, of course, for the purpose of attracting business, and so far, are possibly successful, but here their object ends, very few of the brokers having actual business in even a fair proportion of the stocks they advertise.

Second.—That where business in the shares of a mine is not extensive an advertiser fixes the price in his advertisement a little below those of other advertisements in the Journal of the preceding week, thus hoping to place himself in a position of advantage to catch a new client. In this manner the shares of first-rate companies, not, however, much dealt in, are knocked down from a fair price to a low one, not only without business having been done, but without the advertisers having any business to do. Great dissatisfaction is necessarily caused to the shareholders whose property and interests are injured by this means, and also to the public, who, fancying the shares are cheap, find they cannot get them at the price advertised. This is the great objection evinced by the secretaries and directors of mining companies, and also of a large number of those already interested as shareholders in mining.

Third.—In connection with the last reason, it may be pointed out that there are, as is well known, large numbers of companies which go to the wall solely because a little, and sometimes very little, more money is required to ensure success—money which cannot be obtained because of the difficulty of issuing new shares at a price higher than the quotations contained in advertisements.

the low figures of which, at least in part, are caused by the advertisements themselves.

Fourth.—Many brokers advertise, not shares "for sale," but "special business" in them, at very low prices. Their fellows and the public nevertheless naturally understand them as "sellers," at the quotations given, and the former accordingly alter their prices, as suggested in Reason No. 2, whereas the advertiser may be either a buyer or really have no business at all.

Fifth.—Brokers and jobbers find that advertising at fixed prices causes such keen competition that where business can be done it leaves either no margin for profit, or such an amount only as to make it worth nobody's while to transact it. This appears a selfish reason, but the "labourer is worthy of his hire," and outside dealers, that is the advertisers, would be quite content, notwithstanding the greater difficulty in dealing in mine shares, could they get such a "turn" as is obtainable from investment stocks in the "house."

Sixth.—It is the circular broker and the promoters who first draws attention to mining, and I will venture to say that the *bona fide* men of these classes not only give correct quotations, but would be perfectly satisfied for their profits with the legitimate "turn of the market," as shown by the official quotations of the Stock or Mining Exchange. The share advertiser, however, by advertising unfairly low prices of shares, in which he has quite possibly no actual business, not only robs him of the legitimate result of his enterprise, but he, at the same time, severely injures his (the circular broker's) business, and stems the torrent and dams the river, which is really, to a large extent, the source of his own livelihood.

Seventh.—It is believed that among no respectable community of men, either connected with a Stock Exchange or Bourse, or, indeed, in any other way with the commercial world, is the custom of advertising a stock or commodity in vogue. Market quotations are taken as sufficient for all purposes, and there is no valid reason that I know of why mining should be made an exception to the rule. Truly, the movement to omit prices from advertisements is one, as you correctly term it, of "protection;" but I think it is a necessary one not only for the protection of mining sharedealers, but also, what is much more important—the public—themining shareholder. If I may take the expressed opinion of mining secretaries, as representing that of the shareholders interested in their companies, there can be no doubt that the desire that "fixed prices" should be omitted from advertisements is entertained, in addition to the sharedealers, by probably 100,000 different individuals interested in mining.

We now have to consider the complaints you have received respecting the movement I have remarked upon, and then, lastly, the protection which may be obtained against the absurdly incorrect quotations of some circular brokers.

As regards the complaints I would ask whether the receipt of one letter, or even a dozen coming every week, and upon the same subject, is not likely to create an exaggerated impression in an individual mind of the aggregate number received, and of their importance. I would also ask how much the complaints you have received weigh in the balance of importance when compared with the expressed wish of the many thousands of shareholders who are represented by the secretaries I have already referred to, and also by the majority of brokers and dealers, whether members of the house or outsiders? I ask these questions in no way underrating your statement of the number of complaints you have received, but to ascertain whether it be not possible that by pressure of business and consequent want of time to consider the subject you may not have set an undue value on their importance. I would further ask whether these complaints do not emanate for the most part from speculators, pure and simple, for rise and fall (the genuine mining investor never, in my experience, cavils at a fair price as shown by market quotations) men who look for a quick profit from an advance or otherwise in prices, and care not one jot for the success or failure of the concern in the shares of which they have become a "bull" or "bear," men who do infinite harm to mining as a pursuit and not one jot of good, men of whom in your legal report headed "New Companies and Speculators," you write "The loudest complaints usually come from speculating applicants for shares who, until they discover that they have made a mistake, or that their normal cunning has been at fault, care nothing for the intrinsic merits of the enterprise with which they have connected themselves, and do not trouble themselves to enquire whether the concern is based on fraud or otherwise," men of the class of whom you give an instance, saying "he does not appear to have laid himself open to the charge of intentional recklessness, but he certainly appears to have displayed too little caution throughout to justify him in making any complaint whatever, yet he repudiated his liability in a manner most calculated to damage the interests of all concerned."

With reference to the protection of the public I am somewhat surprised that you permit to pass unnoticed your correspondent's ("R.N.") remark that "the so-called market quotations in the centre page and in the Share List should never be relied on," as this appears to me, as regards the centre page of your Journal, to be a direct charge against your City Editor of want of care in writing his article, in giving quotations, and consequently in protecting the interests of the public. From a long personal knowledge of your City Editor, and of the way in which his prices are obtained (these are obtained in open market from Stock Exchange men of repute and the most respected members of the market—a pretty noise they sometimes make when opinions differ as regards the exact price of a share not extensively dealt in—and, I think I may say, are the basis of the price-lists issued afterwards by the shareholders in whom your correspondent appears to put faith). I fearlessly assert the quotations given by him on the centre page are correct and reliable, and no greater care could be exercised in the interests of the public than is afforded to the subject by the gentleman referred to. As regards the back page of the Journal, however, there is certainly large room for complaint, but this arises, I think, from many of the companies mentioned not being generally known, and the nominal character of the business in their shares.

On this subject, the best protection required by the public will probably be found in the remedy afforded by the just laws of our country, which are sufficiently heavy on those who make misrepresentation, or who charge absurd prices for stocks they are commissioned to purchase. I also think that in mining matters the required protection rests, as it should do, Mr. Editor, very largely in your able hands; and I would suggest that a far greater measure of this would be afforded were you to considerably extend the number of quotations given on the centre page of your Journal, ruthlessly excluding from the last page the names of companies whose shares are not generally dealt in, or, at least, the quotations of them. A would-be investor, when unable to find a quotation in your paper for a mine which he has had recommended to him, would certainly come to the conclusion that the subject demanded enquiry on his part from one or two respectable brokers. No one but a fool would omit to make this, and I believe there is the "highest authority" to the effect that there is no legislation which will protect, or indeed even be salvation for, such a class of people. As a further protection of the public I believe that so long as the rules of the mining market do not clash with those of the Stock Exchange, with whom much business is transacted, the former would cordially agree to any system of business assuring the desired end. The immediate delivery of stocks purchased or cash business would perhaps be supported if it were found it did not too much interfere with Stock Exchange business. It might, however, have the effect you deprecate of temporarily forcing up prices; but it has never been my experience that the public has objected to this. It is the reverse they don't like.

In conclusion, as having, to your knowledge, I believe, been a broker or otherwise engaged in mining for about 18 years, I would state it as my firm conviction that advertising prices is harmful both to the interests of the public and to the sharedealers. I trust it may be permanently discontinued, and, as affording the needful protection to the public, I would again suggest that the quotations on the centre page of your Journal be considerably extended, and that, if possible, a greater and more searching censorship should be exercised over the prospectuses of new companies, the circulars of unscrupulous promoters and brokers, and, in fact, over everything affecting those great and valuable interests represented in the *Mining Journal*.—*St. Swithin's-lane, July* 10. TEA.

BRYN-YR-AFR, AND ITS PROSPECTS.

SIR,—During the extreme depression that mining has for a long time been passing through it is highly satisfactory to be enabled to forward you the following statement of facts relative to the Bryn-yr-Afr Lead and Blende Mine, in the Goginan district:—This energetic company commenced the sales of lead and blende ores in 1881, and by opening out the adit level, which is about 14 fathoms deep on an average, through a course of rich ores for 60 fathoms in length, they have already returned 800 tons of ores, in which are included 120 tons of cobbled blende, which made a percentage of from 58 to 62, and it is estimated that there remains on the stulls and unwrought over the adit level 400 tons yet, broken and to take away. An engine-shaft has been sunk 11 fathoms under the adit, in the centre of the ore deposit, which has passed through rich lead and blende, the bottom of the shaft yielding 4 tons per fathom of the very finest description, being composed of carbonates, sulphurets, and phosphates, sure indicators of being on the top of an immense body of ore. It is calculated at the present depth of the engine-shaft by driving under the ore gone down in the bottom of the adit that 1500 tons of ore will be laid open for profitable working.

During the time of opening the mine as described underground the company have had erected the following very powerful machinery for the effectual and economical working of their property, which has been accomplished with skill, tact, and judgment, and reflects great credit on all parties connected therewith:—A wheel 40 ft. diameter, 4 ft. breast, for pumping and drawing on the Camdwr stream; also other powerful wheels for crushing, jigging, and necessary dressing apparatus, and which is still being extended during the present dry season.

It is but right and proper that this should be made known through the columns of the *Mining Journal* for the benefit of all concerned, and as a silver lining to a dark cloud. C. O. M.

Aberystwith, July 9.

THE TANKERVILLE COLLAPSE.

SIR,—More than two months have passed since the Tankerville Mining Company went into liquidation, and left the men two months short of their pay, and I have heard nothing of what they have done nor when they are going to pay the men. As I am one of the sufferers I should be glad if you can give any information in your Journal. I left the Bog about six weeks ago, and happened to get work in Birmingham.—*July* 8. H. E.

SPANISH IRON ORE SHIPMENTS.

Messrs. T. and E. S. BELL, of Bilbao, favour us with the following statement of the total amount of ore shipped from that port from Jan. 1 to June 30, 1884:—

		Tons.	Tons.
Wales	Cardiff	303,993	
	Newport	202,641	
	Port Talbot	5,567	
	Swansea	41,253	
	Britonferry	7,623	
	Porthcawl	11,561	
	Mostyn	777 =	573,415
Cleveland District	Newcastle	128,546	
	Middlesborough	139,651	
	Stockton	27,945	
	Sunderland	19,701	
	West Hartlepool	19,315 =	335,158
Scotland	Glasgow	176,461	
	Grangemouth	7,524	
	Ardrossan	12,252	
	Boness	4,481	
	Ayr	3,115 =	203,833
Lancashire and Cumberland	Workington	2,991	
	Garston	1,319 =	4,310
Other parts of England			1,470
Total shipped to Great Britain			1,118,186
Belgium	Ferneuzen	28,890	
	Antwerp	43,315 =	72,205
France	Dunkerque	84,954	
	Bayonne	40,114	
	Boulogne	48,401	
	La Rochelle	31,997	
	Bordeaux	3,733	
	St. Nazaire	34,968	
	Basse Indre	214	
	Hennebont	368 =	244,749
Holland	Rotterdam	238,935	
	Amsterdam	31,907 =	270,842
America	New York	503 =	503
Corsica	Bastia	2,629 =	2,629
Total shipped to other countries			590,928
" " Great Britain			1,118,186
Total shipped from Bilbao			1,709,114
Total shipped from Bilbao from Jan. 1 to June 30, 1883			1,746,474

Decrease on 1883, 37,360 tons; on 1882, 31,689 tons.

INDIAN CONSOLIDATED GOLD COMPANY.

The directors in a circular to the shareholders state that they propose to hold the ordinary general meeting rather later in the year than usual, but furnish full particulars as to the present position of the mining work, bringing the history of operations up to date. Col. Henderson and Mr. Grove having resigned their respective appointments during the course of the past 12 months, Mr. H. Lyon has been appointed resident agent, and Mr. Longbottom has had charge of the mining operations. The latter's term of office is now about to expire, and Capt. Sheriden, an Australian gold miner of great experience, will be responsible for the mining and milling work. These changes, together with certain reductions of staff (rendered possible by all the force being concentrated on the Agnew reef, the now ascertained best lode), have resulted in a great decrease of expenses, while the present establishment is quite sufficient for the work in hand.

Of the 13 samples of ore (amounting to 30 tons in all) brought home from different parts of the property, that from the Grove section of the Agnew reef yielded much the best results by assay, ranging from 3¼ dwts. to 1 oz. 17½ dwts. of gold per ton; 2 tons of this particular ore are now being treated by two different processes, and when finished, the results will be made known to the shareholders. This particular reef, which thus appears by assay of samples to be the richest reef on the property, is also certainly the largest and most persistent of any yet worked upon. True, their largest crushing (589 tons) resulted in an actual yield of only 74 ozs. of gold, or 2½ dwts. to the ton, but as Mr. Darlington says in the annexed memorandum:—"While the Agnew reef holds a wide and persistent course, it is not unreasonable to hope that in extending the levels, quartz more highly charged with gold than any yet exposed will be met with. An unusually scant supply of water has caused a cessation of crushing operations during the spring and summer months; but the board felt that the circumstances of the case, and the quality of the ore then exposed did not justify the expense of crushing by steam-power. It was judged far wiser to strain every effort to develope the lode, so as to make available plentiful supplies of quartz for crushing by water-power directly the rainy season should commence. The capability of the crushing machinery is, in fact, still far in advance of the reserves of ore.

Mr. A. G. Charleton having written a pamphlet on "Gold Mining in the Wynaad," it occurred to some large shareholders that if he visited India, and saw the ore on the spot and the mills at work, he might be able to make some recommendations for their improvement; the directors have, therefore, united with some other gentlemen interested in gold mining in the Wynaad, in commissioning him to proceed to India for the purpose of inspecting and reporting on the property, and more especially on the processes heretofore adopted for actual gold saving, and to make any recommendations that may occur to him for their improvement. His report, which will be an exhaustive one, cannot be submitted for several months. When Mr. Charleton's report comes to hand, and when the expected large crushing of some 3000 to 4000 tons of quartz from the Agnew reef shall have been completed, the directors will call the meeting. The securities and cash now in hand amount to 45,000*l.*

Mr. JOHN DARLINGTON, July 4, writes:—GROVE SECTION—AGNEW REEF.—The work executed on the Agnew reef includes the drivage of No. 1 level, which has a length in quartz of about 320 ft.; dividing the quartz for extraction purposes by means of three sinks each about 100 ft. deep on the line of the reef; the completion of No. 2 tunnel through country rock a length of 153 ft., and the extension of an exploratory level on the quartz to Nos 1 and 2 sinks, and north of the latter sink towards No. 3 sink. Throughout these workings the reef is wide and persistent, and will afford approximately, 10,000 tons of quartz.

WORK TO BE EXECUTED, &c.—It is intended to push the drivage of Nos. 1 and 2 levels northwards on the Agnew reef to extract the largest possible quantity of quartz for milling purposes during the prevalence of the existing monsoon, and to sink below No. 2 level on the reef itself should the forthcoming milling results be of a favourable character. The whole of the works are laid out to effect the removal of quartz in an economical and expeditious manner, while no machinery or materials will be necessary for this purpose other than that which is already on the mine. The depth attained on the line of the reef from surface at No. 1 sink is about 150 ft. The quartz already extracted from the reef at No. 1 level is confined to a length of 110 ft., and to a depth of 25 ft., the contents of which is roundly 1000 tons. The crushing of 589 tons of this quartz afforded 2½ dwts. of retorted gold per ton.

MILLING QUARTZ.—Every care and precaution has been taken to mill the quartz carefully, and to collect reliable statistics of the results. The gravitation stamps have proved to be highly efficient. Each head reduced during the last milling campaign at the rate of 48 cwts. of quartz per day of 24 hours, or equal to the reduction of 48 tons per 20 heads. It may, therefore, be assumed that 20 heads, if worked continuously night and day, will reduce 1000 tons of quartz per month. The apparatus in front of the stamps includes carefully dressed plates, mercury boxes, and riffles for amalgamating the gold, together with end-blow shaking tables for concentrating the pyrites. This pyrites or concentrates is then amalgamated in Wheeler pans, the tailings of which pass through two sets of Hungarian mills, and from thence through a wooden flume 1500 ft. long, to collecting ground contiguous to the site of the lower mill.

GOLD IN QUARTZ.—The gold in the quartz is believed to be in a fine state of division, very light, and easily carried by the milling water into the tailings. During the milling operations about to commence practical attention will be given to the subject of introducing some additional gold saving appliances.

CONDUCT OF WORK.—The whole of the work is carefully conducted, all unnecessary expenses are avoided, while the staff up the ground is of a practical and economical character. The end kept in view is to develope the reef as rapidly as possible, to discontinue operations at any given point when not justified by the prospects of the case, and to discover quartz sufficiently rich in gold to give a permanent value to the undertaking. While the Agnew reef holds a wide and persistent course it is not unreasonable to hope that in extending the levels quartz more highly charged with gold than any yet exposed will be met with.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE CEYLON LAND AND PRODUCE COMPANY (Limited).—Capital 50,000*l.*, in shares of 10*l.* To acquire by purchase or otherwise land and estates in Ceylon, and to carry on the business of planters, &c. The subscribers (who take one share each) are—J. Wilson, Edinburgh; T. Anderson, 45, Billiter-square; W. Robertson, 85, Holland Park; T. A. Shepherd, 79, Mark-lane; G. H. Gordon, 37, Lombard-street; T. J. Laurence, 37, Lombard-street; F. Chaplain, 79, Mark-lane.

THE BROADSTAIRS HOTEL AND LAND COMPANY (Limited).—Capital 50,000*l.*, in shares of 10*l.* To purchase, maintain, and carry on the Grand Hotel. The subscribers (who take one share each) are—J. R. B. Dodson, Sheffield; A. C. Hill, 11, Sinclair-road; W. Rasen, Broadstairs; A. A. King, Highbury; H. H. Knill, 37, Cheapside; H. S. Miller, 67, Milton-road; J. Schwitzer, 53, Loughborough-road.

THE HETTON COAL COMPANY (Limited).—Capital 441,000*l.*, in shares of 350*l.* To carry on the business of colliery proprietors, mineowners, miners, coal manufacturers, and merchants in the county of Northumberland. The subscribers (who take one share each) are—R. A. Cochrane, St. Neots, gentleman; B. H. Cochrane, Melton Mowbray, gentleman; A. H. Cochrane, York, gentleman; M. Dunn, Newcastle-on-Tyne, gentleman; W. G. Armstrong, Jesmond, knight; G. L. Wood, Freeland, gentleman; L. Wood, Southull, gentleman. The following gentlemen constitute the first board:—R. A. Cochrane, B. H. Cochrane, A. H. Cochrane, M. Dunn, G. L. Wood. Qualification, 30 shares.

THE UNIVERSAL TELEGRAPHIC COMPANY (Limited).—Capital 60,000*l.*, in shares of 1*l.* To carry on in all branches the business of a telegraphic company, as principals or otherwise. The subscribers (who take one share each) are—A. Le Marquant, Paris; J. Declem, 34, New Bridge-street; A. Kilday-Seacroft, Sydenham; W. C. Cooper, 30, King's Arms-yard; F. W. Bull, Brixton; C. Darly, 24, New Bridge-street; S. A. Lillicrap, Stoke Newington.

THE LONDON DRAPERY COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To purchase the business of drapers, silk mercers, &c., belonging to Messrs. Swan and Edgar, situated in Regent-street, London, and to carry on same. The subscribers are—L. Edgar, 10, Piccadilly, 100; F. Schroder, 10, Piccadilly, 100; J. S. Rolfe, 10, Piccadilly, 100; S. Wood, Balham, 1; O. Barton, Clapham, 1; J. Teppeli, Herne Hill, 1; R. Glass, Clapham, 1.

THE ALDRINGTON AND BRIGHTON COMPANY (Limited).—Capital 200,000*l.*, in shares of 10*l.* To carry on all operations connected with a land company and a building society. The subscribers (who take one share each) are G. Smith, Lewisham; R. Kersey, Lee; W. J. Williams, Brighton; H. Boys, Blackheath; H. Hasker, Dalston; W. Claydell, Great Ilford; H. J. Words, Blackheath.

THE PATENT SLATE, BRICK, AND SANITARY TUBE COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* The usual business of quarrymen, brickmakers, potters, manufacturers of slates, slabs, &c., and the acquisition of certain patents. The subscribers (who take 30 shares each) are—C. T. Stewart, Bayley's Hotel; K. Burr, West Brighton; T. J. W. Flint, Canterbury; E. A. Rogers, Cormonthon; C. H. Pulliver, Wallington; H. J. Bartlett, Upper Tooting; A. J. Ward, 39, Mathison-road.

THE MERCHANTS' EXCHANGE AND OFFICES COMPANY (Limited).—Capital, 30,000*l.*, in shares of 50*l.* To acquire certain property in Cardiff, belonging to the Marquis of Bute, and to erect and maintain various buildings and hereditaments thereon. The subscribers (who take one share each) are—H. Heywood, Cardiff; G. H. Wills, Cardiff; J. Cory, Cardiff; A. T. Lucovich, Cardiff; J. N. Flint, Cardiff; E. R. Moxey, Cardiff; W. B. Gibbs, Cardiff.

THE TRANSVAAL SYNDICATE (Limited).—Capital, 100,000*l.* in shares of 1*l.* To acquire by purchase or otherwise, improve, develope, colonise, and cultivate lands in the Territory of the South African Republic. The subscribers (who take one share each) are—F. Power, 101, Huddleston-road; E. A. Melton, 26, Hornsett-road; C. J. Boyce, Barnsbury; W. J. Tugwell, 5, Shenley-road; T. Brutton, 33, Lyall-road; R. J. Hardy, 61, Amherst-road; G. W. Wharrie, 32, St. Paul's-road.

The VIENNA AND NEUSTADT ICE COMPANY (Limited).—Capital, 50,000*l.* in shares of 1*l.* The business of an ice manufacturing company for the supply of Vienna and neighbourhood. The subscribers (who take one share each) are—J. P. Healey, 108, Bishopsgate-street; E. T. Hollins, 33, Chapter-street; C. Beddall, 31, Lombard-street; E. Hüter, 29, Mincing-lane; G. J. Scott, 14, Queen Victoria-street; E. H. Symons, 120, Highbury Hill; G. E. Hooke, 3, Crown-court.

THE BODMIN TIN COMPANY (Limited).—Capital 15,000*l.*, in shares of 1*l.* To acquire by purchase a certain mining property, situated in the Duchy of Cornwall, and to fully work and develope the same, and generally to carry on all operations connected with mining, smelting, reducing, and otherwise treating and disposing of the ores, &c. The subscribers (who take one share each) are—W. P Partington, Paris; Col. H. W. Spratt, Blackheath, architect; T. Bantook, Wolverhampton, alderman; E. Smith, Abchurch Chambers, solicitor; W. Hope, Wandsworth, surveyor; J. Pearless, 3, Copthall Buildings, merchant; G. Ryman, 73, Palmerston-road, accountant. The subscribers will appoint the first directors, whose number must not exceed seven or be less than three. The qualification is fixed at 100 shares.

THE VILLARICOS SILVER-LEAD MINING AND SMELTING COMPANY (Limited).—Capital 60,000*l.*, in shares of 5*l.* To adopt and carry into effect a certain agreement made between J. M. Lacasa, of Valdes, of the one part, and F. W. Bentley, on behalf of the company, of the other, for acquiring by purchase or otherwise any interests in lands, mineral or mining rights, or silver-lead, silver, copper, or other mines situated in Spain, and to carry on the business of miners, smelters, metallurgists, &c. The subscribers are—W. H. O'Shea, Albert Mansions, M.P., 50; R. Hammond, 117, Bishopsgate-street Within, merchant, 50; F. C. Barker, 117, Bishopsgate-street Within, merchant, 50; G. Clifton-Peckett, Garrachi, Vice-Consul, 50; F. Ince, St. Benet's Chambers, 1; P. A. Latham, Ealing, secretary, 1; W. R. Jackson, 141, Plimsoll-road, shorthand writer. The following be the first directors—The Marques de Perijaa, Messrs. G. C. Peckett, jun., W. H. O'Shea, and F. C. Barker. Don Manuel Lacasa will join the board after the first allotment of shares. The qualification is fixed at 50 shares or 250*l.* in stock, and the remuneration 500*l.* per annum to be divided.

OLD GUNNISLAKE.—An important improvement has taken place here since the meeting. Captains Skewis and Seccombe (July 5) write:—"On taking down the lode in the western end to-day we find it has very much improved for tin since our report for the meeting, held on July 3. In fact it is so much in advance of anything that we have heretofore seen that we are very sanguine we are on the eve of great results. We hope to be able to report more fully in a few days or a week's time after assays have been made."

FOREIGN MINING AND METALLURGY.

Prices have not varied upon the French markets, and notwithstanding the efforts of producers not the least progress appears to have been made towards the attainment of higher quotations. Pig is being disposed of with extreme difficulty, and stocks are increasing in the Longwy district to rather a serious extent. It is difficult under these circumstances to see how an advance can be seriously attempted in rolled iron. The Paris, Lyons, and Mediterranean Railway Company is stated to have concluded a contract for a rather considerable quantity of plates. The Ariège Forges Company has also obtained an order from the Southern of France Railway Company for the greater part of the axles required by that company during the next two years. The consumption of pig, iron, and steel in France in 1883 is officially returned as follows:—Pig, 2,317,000 tons; iron, 1,147,000 tons; and steel, 486,000 tons. Pig has shown no improvement upon the German markets, recent transactions have been of comparatively little importance, and have been concluded at very low rates. Iron has been in some demand upon the German markets, but prices have remained at a comparatively unremunerative level. The German steelworks are still well employed.

There are few changes to notice in the general position of the Belgian iron trade; the prevailing monotony is, of course, not favourable to the circulation of any exciting news. The situation continues difficult, the works not receiving a sufficient number of orders to keep them fully employed. After all, however, the condition of the Belgian iron trade is not worse than that of English, German, or French metallurgical industry. It should also be observed that there is not more to complain of now in the Belgian iron trade than there was a week since. The close of last week was even marked by the arrival of a few new orders. English casting pig has made 2*l.* 3s. per ton upon the Belgian markets, while Luxembourg pig has brought 2*l.* 2s. 6d. per ton. No. 1 iron has brought 4*l.* 10s. to 4*l.* 12s. per ton; No. 2 has made 4*l.* 16s. per ton; and No. 3, 5*l.* 2s. per ton. Girders have been quoted from 4*l.* 16s. to 5*l.* per ton. No 2 plates have made 6*l.* 4s. per ton; No. 3 ditto, 7*l.* per ton; and No. 4, 10*l.* 4s. per ton. M. Dupuy de Lôme, managing director of the Forges et Chantiers de la Mediterranée, has submitted a paper to the French Academy of Sciences on an extraordinary cannon which the company under his direction has been making for Spain. According to M. Dupuy de Lôme, the new projectile exceeds in power all other cannon, Kropp's and Armstrong's included.

The Belgian Coal Trade has remained in much the same state. The situation certainly is not very discouraging upon the whole; things might no doubt be a great deal better, but, on the other hand, they might be much worse. Stocks are slightly increasing, but there is nothing surprising in this, having regard to the season of the year. Prices have scarcely varied during the last few days upon the Belgian coal markets. Industrial coal is still in pretty good request, but only relatively so. In the Couchant de Mons contracts which have run out have been renewed at previous rates. The profits of the following nine collieries in the province of Liége exceeded 4000*l.* each last year—Marihaye, 27,256*l.*; Kessalls, 13,372*l.*; Hasard, 12,240*l.*; Cockerill, 11,754*l.*; Six-Bonniers, 8922*l.*; Horloz, 7628*l.*; Gosson, 6488*l.*; Nouvelle-Esperance, 5760*l.*, and Concorde, 4680*l.* The profits realised from the production of coke and briquettes are not included in some of these totals. There were 51 collieries in working in the province of Liége last year, and their combined production was 4,095,191 tons. The German coal trade continues to present a rather favourable tone. Prices are not very brilliant, but they are still fairly remunerative, and there is not much to complain of in the general course of affairs. German coal is stated to be gaining ground in Italy to a rather sensible extent. Quotations have experienced no material change upon the German coal markets.

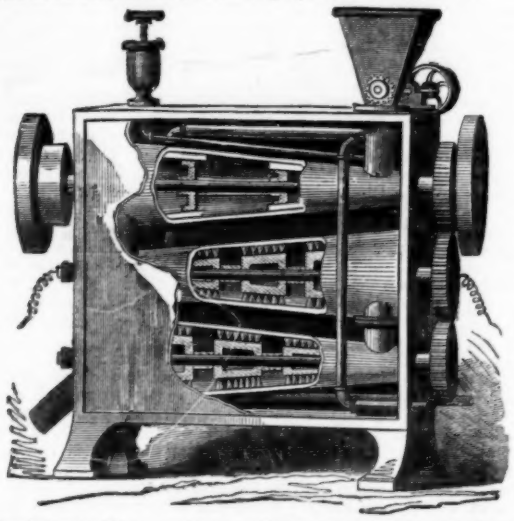
TANNIC CEMENT—EFFICIENT BOILER JACKETING.—Although the jacketing of boilers with a view to economising fuel by preventing the radiation of heat has frequently been recommended difficulties have constantly arisen through the imperfect preparation or careless choice of cement. All the defects, however, have it seems now been removed by the introduction of the patent tannic cement, which has recently been brought into the market by Messrs. DAVID BURNS and Co., of Carlisle. It is a non-conducting composition for covering steam boilers, steam and hot water pipes, cylinders, and all other heated surfaces, so as to prevent loss of heat and deterioration. It is claimed that the tannic cement prevents loss of heat by radiation and convection; increases the power of the boiler to which it is applied; saves fuel and labour for a given power from 15 per cent. and upwards (usual saving 40 per cent.); enables the boiler to deliver dry steam; enables steam-pipes to carry steam long distances with only a nominal loss of pressure; reduces condensed water to a minimum; is very adhesive; does not crack and peel off; will last many years; does not contain horse-litter, sawdust, or other offensive or perishable material; does not contain slag, or other substance carrying sulphur, and will not act injuriously on any metallic substance; forms when newly applied a thin coating of black oxide, and this protects the metal completely from rusting; and, moreover, is the cheapest really good cement in the market, and will save first cost in a few weeks. The patentee having had occasion to carry steam over 450 yards in an exposed situation, it devolved on him to find the best covering in his power to protect the pipes from loss of heat, and consequent condensation of steam. He set about experimenting with such compositions as he found in the market, and though these gave good results—for a poor covering is better than none—they all showed some defect it was desirable to avoid. He consequently commenced a series of experiments with the best non-conducting substances in Nature, and after many trials produced the tannic cement which, when applied to the pipes enabled them to carry the steam with only a small condensation, and no appreciable loss of pressure. To suit the views of all classes of users the manufacturers have arranged either to supply the cement as a soft mortar, which can be put on by an ordinary workman, or to contract to cover boilers and pipes by their own workmen.

HOLLOWAY'S OINTMENT AND PILLS are the best, the cheapest, and the most popular remedies. At all seasons and under all circumstances they may be used with safety and with the certainty of doing good. Eruptions, rashes, and all descriptions of skin diseases, sores, ulcerations, and burns are presently benefited and ultimately cured by these healing, soothing, and purifying medicaments. The ointment rubbed upon the abdomen checks all tendency to irritation of the bowels, and averts dysentery and other disorders of the intestines. Pimples, blotches, inflammations of the skin, muscular pains, neuralgic affections, and enlarged glands can be effectively overcome by using Holloway's remedies according to the "instructions" accompanying each packet.

NOVEL ELECTRO METALLURGICAL MACHINE.

PROFESSOR JAMES MANES AND SONS call the attention of miners, mineowners, capitalists, and others interested in the working of gold or silver mines to their new Electro Metallurgical Machine for extracting fine and rusty gold from sands or tailings of stamp mills, or the sands of hydraulic gold diggings, or from the black sands on the coast of Oregon or California, and other parts of the world where gold is found.

The problem that has long troubled the worker of free-milling gold and silver ores is a method to save the mineral now lost in the tailings of stamp mills or flumes. This alone, if it could be saved, would amount to many million dollars profit each year, besides enabling the working of much territory which is now lying idle for want of an economical and thorough process of treatment.



Prof. James Manes and Sons, of Denver, Colorado, U.S., have invented a machine (represented in the above engraving) which it is claimed will save nearly the entire amount of mineral which passes through it, the loss not being over 10 per cent., and in many cases not in excess of half that amount. The machine is a cheap and practical process—it never need stop for charging or cleaning up, being nearly self-acting. Steam, electricity, and mercury are used in the process of extracting the mineral.

This machine or amalgamator is adapted for free-milling gold or silver ores, or refractory after roasting. It consists of a series of three or more large cylinders, wider at one end than the other, placed one above the other in a horizontal position, a shaft or spindle running through the centre of each.

The ore and mercury are fed into the first cylinder, passing into the second, and then to the third. The first cylinder is furnished with steel mullers which nearly touch the sides of the cylinder, and revolve at a good rate of speed, mixing the mercury and ore. The second cylinder is furnished with large steel brushes attached to the shaft or spindle, revolving at a high rate of speed; through this a current of electricity is furnished by a Westinghouse dynamic electro machine, which materially assists in gathering the particles of very fine gold together, and thoroughly amalgamating the metal and mercury. The third cylinder is similarly furnished to the second; into this the amalgam passes, and is again acted upon and mixed by the brushes to catch any gold which might have escaped amalgamation in the second. A fourth cylinder may be used if found necessary.

The amalgamated pulp then passes through a revolving copper drum, plated with quicksilver inside. As the drum revolves it takes up the most part of the amalgamated gold. As the inside of the drum is constantly washed with a spray of water from perforated pipes fixed inside of said drum, a clean-plated surface is constantly brought in contact with the pulp or tailings as it passes out from the cylinders. After leaving the drum it falls down on to incline copper plates, the same as is now used in stamp mills.

The amalgam can be collected from the drum and plates without stopping the machine, and any live quicksilver that passes will be caught in syphons. The tailings are carried off with the water. The machine when attached to the flume will be driven by the waste water; it sifts the fine sands from the coarse gravel, and amalgamates it as above.

The specific points claimed by Prof. Manes and Sons in their patent are—

1.—The saving of almost all the mineral passing through the machine.

2.—The loss being less than 10 per cent.

3.—The entire absence of loss of the amalgamated material, thereby saving all the mercury, which, with the processes now in use, there is a large loss both of mercury and the precious metal.

4.—The small cost per ton at which the ore can be treated.

By the addition of the powerful current of electricity that passes off the revolving brushes, the most minute particles of gold will be caught and retained, which in the ordinary flume and stamps passes off with the water; this often amounts to a large percentage.

The inventors state that if English stock companies will give their assistance to work the black sands of Oregon and California by paying for the building of the machines, they will take a share of the gold for their services, or they will send their machines to any part of the world, or will sell patent rights to those desiring any of their patent machines or revolving furnaces for roasting or smelting ores, ball pulverisers, &c.

Prof. James Manes and Sons are agents for the Morey and Sparey Ball Pulveriser, that crushes and pulverises at the same time, and does as much work as eight stamps in a day, crushing either wet or dry.

PRINCIPAL OFFICE OF

Prof. MANES and SONS,

No. 372, Glanarm Street, Denver, Colorado,

U.S.A.

All our machines and furnaces are made by the Colorado Iron Company of Denver, Colorado, the most extensive mining machine works in America.

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CRUCIBLE STEEL CASTINGS

Of all descriptions of special strength and solidity.

ALSO, MANUFACTURERS OF

BEST CAST STEEL FOR ENGINEERS AND MINERS' PURPOSES; FILES; SAWS; HAMMERS; RAILWAY SPRINGS, &c.

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R. MUSHET'S CELEBRATED EXTRA BEST

TITANIC CAST STEEL FOR BORERS

And of R. Mushet's pecial Steel for Lathe and Planing Tools and Drills,

THE STEEL WHICH REQUIRES NO HARDENING.

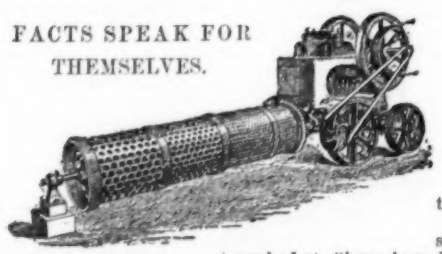
CLYDE STEEL AND IRON WORKS, SHEFFIELD.

BAXTER'S PATENT KNAPPING STONE BREAKER.

THE LAST FOUR MEDALS AWARDED FOR STONE BREAKERS,

1881.

FACTS SPEAK FOR THEMSELVES.



1881.

Our Machine, tested by the Judges Calcutta, broke 7 tons in 45 minutes to 2½ in. ring, and was awarded First Class Certificate and Gold Medal in competition with the Blake Machine.

The ONLY MACHINE which has never failed to do what it was guaranteed, and is also the ONLY MACHINE which has never had a driving shaft broken or the end sent out.

See our Machines now being exhibited at the Crystal Palace, London.

We shall be glad to receive any kind of stone ore or other material to be broken or crushed at Shrewsbury Royal Show, Stand No. 247, in July, either by our Breaker or New Patent Fine Crusher.

We also exhibit at the Highland Show at Edinburgh in July.

PATENTEES AND SOLE MAKERS—

W. H. BAXTER & CO., ALBION STREET, LEEDS.

MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

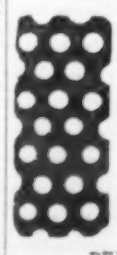
JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.



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THE "ADELAIDE" ROCK DRILL.

THE BEST IN THE MARKET.

ADVANTAGES.

Great Simplicity and Durability. Great Strength and Portability
Great Economy in Consumption of Air. High Rate of Drilling.

REASONS.

It has no Valves or Tappets. ONLY ONE MOVING PART.
It works expansively, & is almost entirely constructed of Steel.

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CRUCIBLE STEEL CASTINGS

Of Special Toughness, Strength, and Durability.

SPECIAL ROCK DRILL STEEL,

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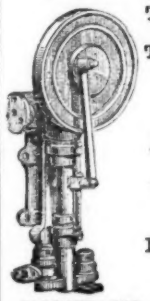

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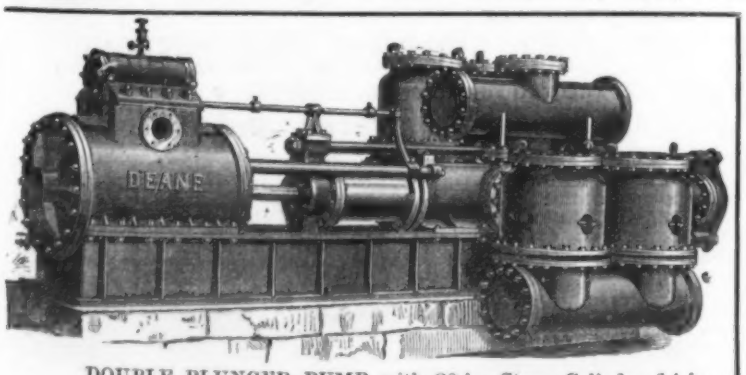

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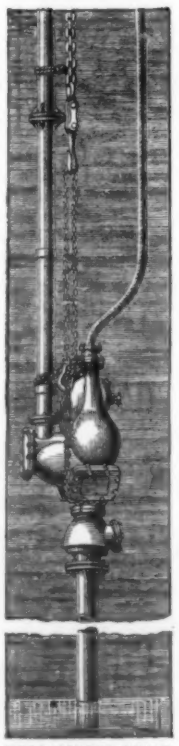

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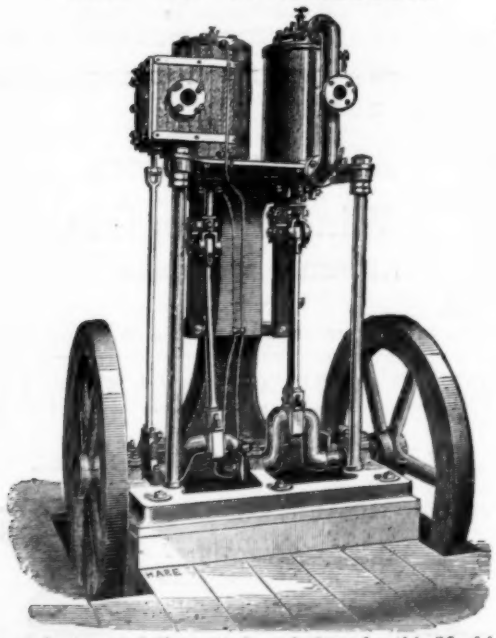

As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stoping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

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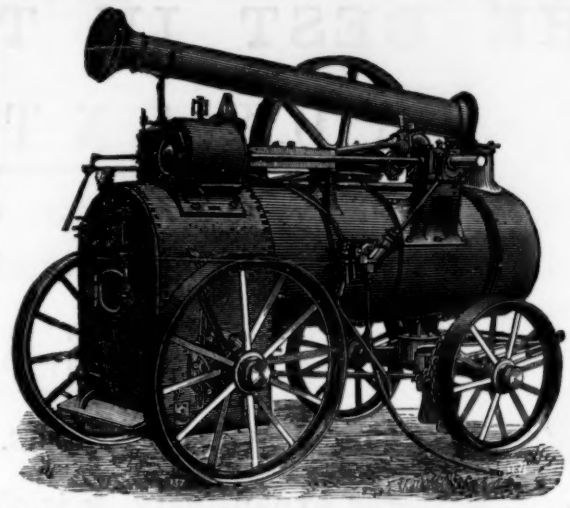

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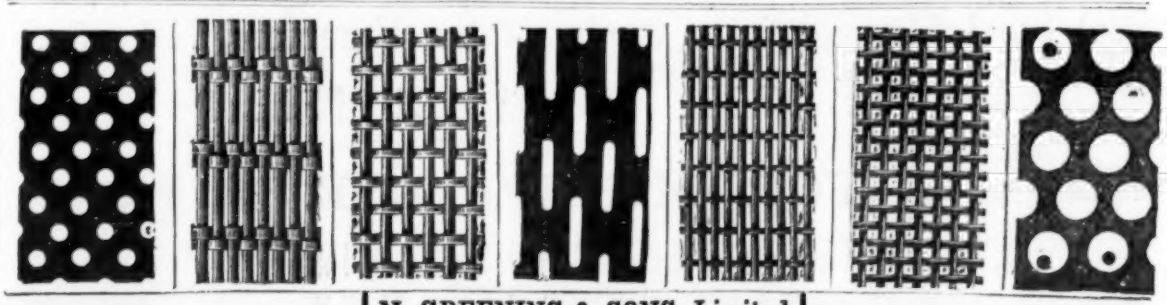

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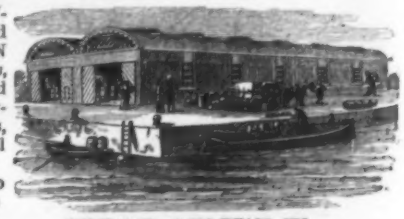

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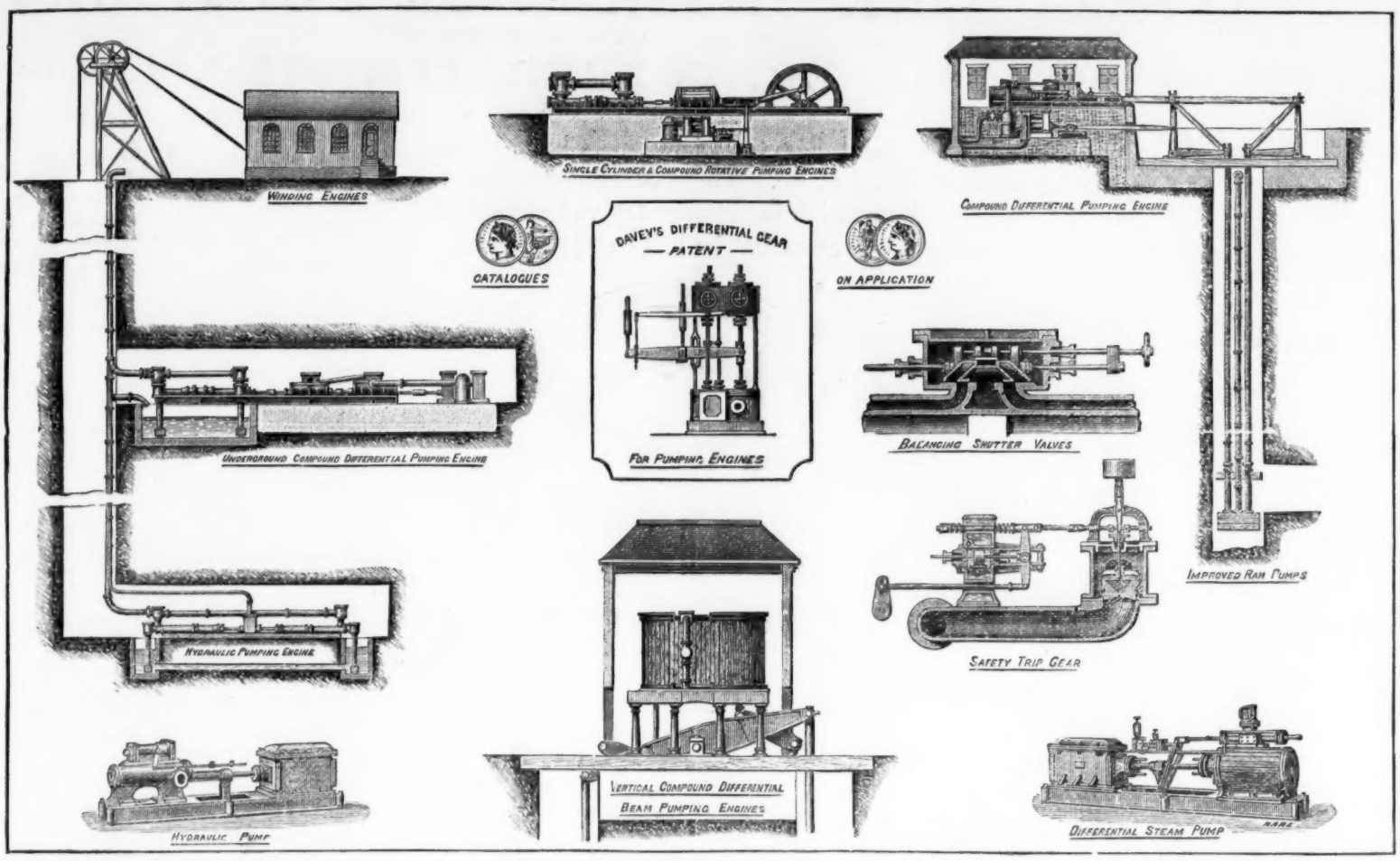

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BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING for High-Pressure Engines.

The following testimonials refer to this Packing:—

New Zealand Shipping Co. (Limited),
S.S. "Ruapehu," Royal Albert Dock, 19th May, 1884.

Bell's Asbestos Works, Southwark.

GENTLEMEN,—I beg to state that your round Asbestos Block Packing was used in the high-pressure pistons of this ship with the following remarkable results:—

14,000 miles continuous steaming without renewal.
Steam pressure ... ... **110 lbs.**
Vacuum ... ... **29 inches.**

My experience does not show an equal result from any other packing. The voyage from New Zealand to Plymouth was accomplished in 37 days 22 hours, being the fastest run from New Zealand on record. Yours obediently, D. HENDERSON, Chief Engineer, S.S. "Ruapehu."

Manchester, Sheffield, and Lincolnshire Railway—Steamship Department,
Grimsby, April 10th, 1884.

DEAR SIR,—I have much pleasure in stating that after a trial of over nine months, and comparing it with other packings, I can confidently recommend your Asbestos Packing. It is especially valuable when high pressures are employed, as in cases where other packings have perished, owing to high temperatures, your packing has invariably stood well. I have also used it with complete success when a gland has heated with other packings, and also in cases of badly scored piston rods. I consider the results I have obtained by its use for our marine engines to have been in every way highly satisfactory. Yours truly,

Mr. J. Bell. G. H. CLARKE, Sup. Engineer.

Department of the Director of Navy Contracts,
Admiralty, Whitehall, 20th June, 1884.

SIR,—I have to inform you that your tender has been accepted for Bell's Rolled Cloth Asbestos Packing to sample submitted:—Elastic core ... ... Square.
" " ... ... Round.

To Mr. John Bell. JOHN COLLETT, Director of Navy Contracts.

The Patent Block Packing is square, as Fig. 1 and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlaid. As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears the trade mark.

BELL'S ASBESTOS BOILER PRESERVATIVE.—This useful mixture by absorbing the free oxygen that is in the water entirely checks pitting and corrosion. It also disintegrates incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that 1/16 in. thick of incrustation causes a waste of 15 per cent. of coal; 1/8 in., 60 per cent.; 1/4 in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler, and covers its own cost a hundred-fold by economy of fuel. It is entirely harmless, and has no injurious action on metals. It can be put into the feed tank or boiler, as may be most convenient. Sold in drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING for Locomotives and all Stationary Engines running at very high speed with intense friction. Sandwell Park Colliery, Smethwick, 1st February, 1884.

To Bell's Asbestos Works.

DEAR SIRS,—I have much pleasure in stating that I have used your Asbestos Packing for the last 13 months for our large winding engines which are running night and day, and also for the fan, pumping, and hauling engines at the above Colliery, and during that period we have not used more than one-third the Packing we had formerly; and this I attribute to your Packing on account of its great durability and general excellence of quality.—I am, dear Sirs, yours faithfully,

THOMAS WINTER, Colliery Engineer.

TRADE MARK.

BELL'S ASBESTOS.

The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All "home" orders should be sent direct to the undermentioned depôts and not through Agents or Factors.

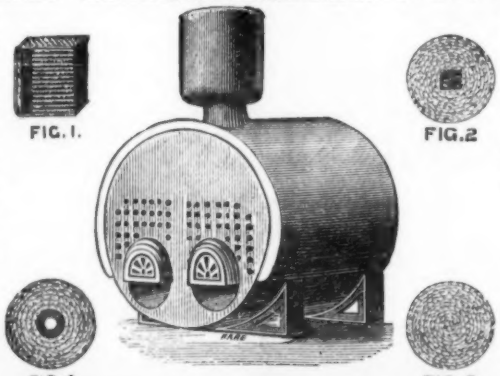

FIG. 1. FIG. 2. FIG. 4. FIG. 3.

BELL'S ASBESTOS BOILER AND PIPE COVERING COMPOSITION, for coating every class of steam pipes and boilers, non-combustible and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is absolutely indestructible. It can be stripped off after many years' use, mixed up with 20 per cent. of fresh, and applied again. The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

A Horizontal Boiler, 17 ft. 6 in. long, 15-H.P., gave the following results:—

Temperature on Plates - - - 186 deg.
" " Covering - - 94 deg.

One ton of coal was saved per week, and although the fire was raked out every evening, 20 lbs. of steam were found in the boiler next morning.

The following Testimonials refers to this Covering:—

Offices of the Wimbledon Local Board, Wimbledon, Nov. 28th, 1883.

DEAR SIR,—It may interest you to know that we save exactly 40 per cent. in fuel through using your covering. Yours truly, W. SANTO CRIMP, C.E., F.G.S.

The Tamar and Kit Hill Granite Company (Limited),
Mr. John Bell, Southwark, S.E. Gunnislake, Tavistock, 8th April, 1884.

SIR,—I have much pleasure in stating that the Asbestos covering applied by you to the boiler of our travelling crane at Kit Hill has yielded most remarkable results. Since it has been in use we have saved fully half our coals, and have effected a great saving in the time it takes to get up steam, which is often a matter of great importance to us. I should add that the crane runs on high gantries, and is fully exposed to all weather. I have formed the highest opinion of your Asbestos as used for this purpose, and as you are aware, have had another boiler similarly covered, though it has not since been used. I can most strongly recommend the material.

I am, Sir, yours faithfully, W. J. CHALK, Assoc. M. Inst. C.E., Engineer and Manager.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors. It is kept in stock in rolls of 100 ft., from 1/2 in. to 3 in. wide, and any thickness from 1/16 in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary. The same material is made up into sheets about 40 in. square, and each sheet bears the Trade Mark, without which none is genuine. It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these inferior articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears the Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and 1/2 millimetre to 25 millimetres thick. Each sheet bears the Trade Mark.

The following copy of acceptance of tender refers to above:—

Department of the Director of Navy Contracts.
Admiralty, Whitehall, S.W., 17th May, 1884.

SIR,—I have to inform you that your tender for Asbestos Millboard has been accepted.—Mr. John Bell. JOHN COLLETT, Director of Navy Contracts.

BELL'S ASBESTOS EXPANSION SHEETING (PATENT). This Sheeting is another combination of Asbestos with India-rubber, giving to the steam user the special advantages of both materials. The India-rubber Washer is protected from the action of heat and grease by an outer coating of vulcanised Asbestos Cloth, thus producing an excellent joint where expansion and contraction render other materials unserviceable. This material is admirably suited to steam pipe joints and every class of valve. Valves made of this material are very durable, as they are not subject to injury by oil.

BELL'S "ASBESTOS LUBRICANT." REGD

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NEW PATENT FINE CRUSHER OR PULVERIZER,

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AND ORES OF EVERY DESCRIPTION

PATENT REVERSIBLE CUBING and CRUSHING JAWS, IN FOUR SECTIONS,

WITH PATENT FACED BACKS, REQUIRING NO WHITE METAL IN FIXING.

CRUCIBLE CAST-STEEL CONNECTING RODS. RENEWABLE TOGGLE CUSHIONS, &c.

OVER **4000** IN USE.

EXTRACTS FROM TESTIMONIALS.
PULVERIZER.

I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone and bring it out like flour."

"In reply to your favour, I have much pleasure in informing you that the 12×3 Pulverizer we had from you is giving us every satisfaction. The material we are operating on is an exceptionally hard one. I am well satisfied with its working."

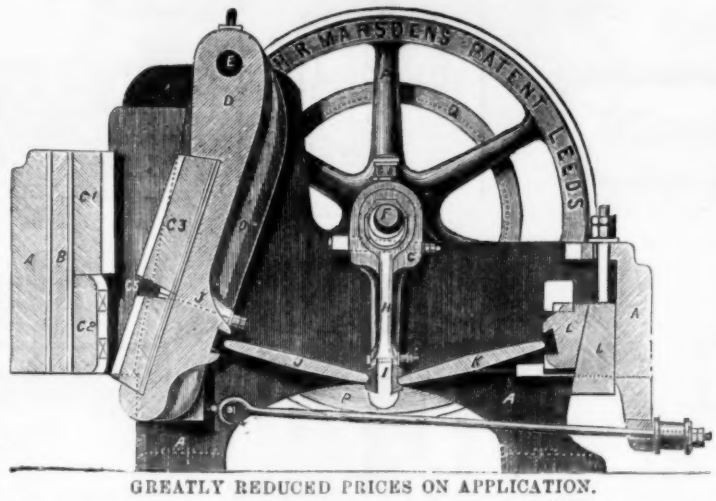
"Our experience is that the motion and mechanical arrangements of your machine are the best for pulverizing that we have ever met with."

"The reports from our mines as regards the working of your Fine Crusher (20×5) recently supplied are very favourable, although we cannot quote you exact figures. On being got into position it was tried *by hand*, with the result that it made short work of the biggest pieces of ore we put into the hopper. You might say how long you would take to deliver another of the same size.'

"As I once before stated, your machine is a perfect pulverizer."

"I am sure the machine will be a success, and a great one, and there is any amount of demand for such a machine. We can work it with 20 lbs. of steam, and our engine, which is a 12-h.p., plays with the work, in fact we run the Stonebreaker and the Pulverizer both together with 35 lbs."

Also Cement, Barytes, Limestone, Chalk, Pyrites, Coprolite, &c., &c. These Machines are in successful operation in this country and abroad, and reference to users can be had on application.



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ROAD METAL BROKEN EQUAL TO HAND, AT ONE-TENTH THE COST.

EXTRACTS FROM TESTIMONIALS.—STONEBREAKER.

"I now order Three of your Stone Crushers, size 15 × 10, to be of your very best construction, and to include two extra sets of Jaws and Cheeks for each. The last two 24×13 machines you sent me, which are at work in this colony, are doing very well. You will soon find that the railway contractors will adopt your machines in preference to the colonial ones—two of which I have. I know other contractors have had as many as nine of them, which have not given very good satisfaction. Once they know of yours thoroughly, I believe you will do a good trade with the colonies. For reference of the high character of your constructions you can refer to me as having used them with the very best results, both in New Zealand and this colony, and much prefer them to the colonial article, both in point of construction and less liability to go out of order. The material we are crushing is very hard blue stone, for railway ballast purposes. Push on with the order as quickly as possible; I do not think it necessary to have any engineering inspection. I have brought your machines prominently under the notice of all large contractors in this colony, likewise the Government. Many of the contractors have spoken to me in reference to their capabilities, and I could only tell them that they are by far and away the best and most economical I ever used. The very last of me having purchased now Eleven from you at various intervals and various sizes, and two above 12 years ago, and having tried all the other makers, is sufficient guarantee of the capabilities and the working of your machines. Yours in every way surpass all others."

"Some of your testimonials do not give your machines half their due. I have seen men hammering away on a big rock for a quarter of a day which your machine would reduce to the required size in a quarter of a minute. I would guarantee that your largest size machine would reduce more of the Cornish tin capels (which is the hardest rock of England) in a day than 200 men, and at 1-25th the cost."

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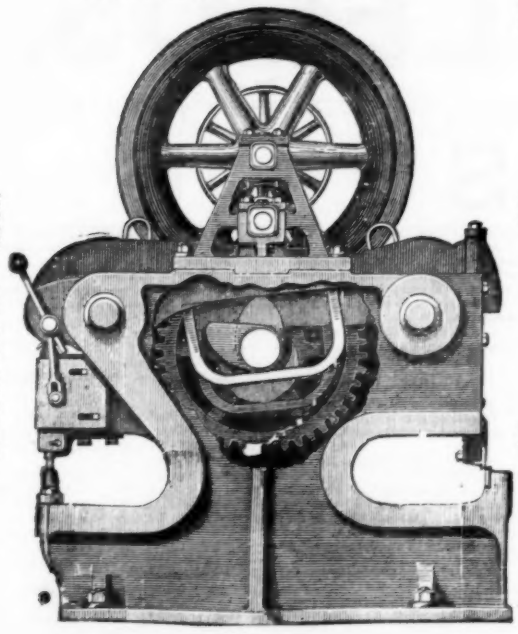

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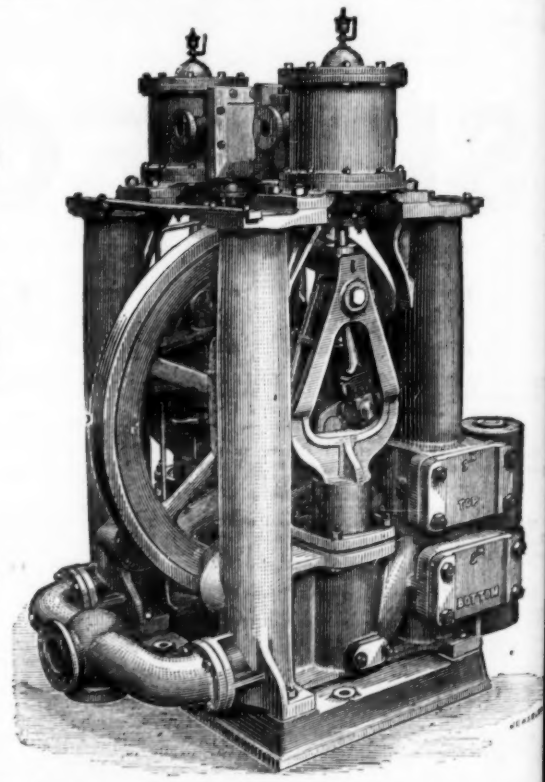

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